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LANCASHIRE COUNTY COUNCIL

ANNUAL REPORT

of the

COUNTY ANALYST

for

THE YEAR 1958.


PRESTON :
PRINTED BY T. SNAPE & Co., LTD., BOLTON'S COURT.
1959.



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PUBLIC HEALTH AND HOUSING COMMITTEE

(1959)

The Chairman of the County Council :

COUNTY ALDERMAN ANDREW SMITH, C.B.E., J.P.

The Vice-Chairman of the County Council :

COUNTY ALDERMAN SIR ALFRED BATES, M.C., D.L.

The Chairman of the Finance Committee :

COUNTY COUNCILLOR J. SELWYN JONES, J.P.

The Chairman of the Health Committee :

COUNTY ALDERMAN T. HOURIGAN, J.P.

Chairman of Committee :

COUNTY ALDERMAN J. W. THORLEY

Vice-Chairman :

COUNTY COUNCILLOR F. L. NEEP

County Aldermen :

W. Bannister, Esq.

H. J. Brett, Esq.

Sir Thomas Tomlinson, J.P.

County Councillors :

G. L. Annett, Esq., C.I.E.
C. Bethell, Esq.
G. H. Dearden, Esq.
D. Dunn, Esq.
S. G. Gittins, Esq.
R. Greenhalgh, Esq.
W. T. Griffith, Esq.
A. Halliday, Esq.
T. G. Harrison, Esq., J.P.
G. E. Hilbert, Esq.
K. H. Hindle, Esq.
Harold Kay, Esq.

F. W. Land, Esq.
S. Lanz, Esq.
J. Lomax, Esq.
H. P. Minton, Esq.
E. Moores, Esq.
W. Myers, Esq.
Miss F. M. Openshaw, J.P.
J. Shepherd, Esq.
W. Starkie, Esq.
J. H. S. Terry, Esq.
F. Whitworth, Esq.

(Three Vacancies)

LANCASHIRE COUNTY LABORATORY

STAFF 1959.

County Analyst :

G. H. WALKER, PH.D., B.Sc., F.R.I.C.

Deputy County Analyst :

A. C. BUSHNELL, F.R.I.C.

Senior Assistant Analyst :

J. COTTAM, B.Sc., F.R.I.C.

Second Senior Assistant Analyst :

M. S. GREEN, B.Sc., A.R.I.C.

Assistant Analysts :

J. L. WILLIAMS

G. W. EARNSHAW

K. FISHER

R. E. BRIDGE, M.Sc.

Mrs. D. FORBES, B.Sc., A.R.I.C.

R. STUBBS, B.Sc.

A. HOLLIS, B.Sc.

T. HODSON

C. E. FENN

Laboratory Assistants :

Mrs. B. SCOTT.

Mrs. S. NEWTON

Miss M. HARRISON.

Clerical Staff :

E. L. SIMPSON, T.D., F.C.C.S.

H. HIGGINSON, A.C.C.S.

Miss O. THOMAS.

Miss S. HARPLEY

Laboratory Attendant :

Mrs. E. FLETCHER.

LANCASHIRE COUNTY COUNCIL

ANNUAL REPORT OF THE COUNTY ANALYST FOR THE YEAR 1958.

To the Chairman and Members of the Lancashire County Council.

I have the honour to submit for your consideration my thirteenth Annual Report which deals with the work carried out in the County Laboratory during the year ended 31st December, 1958. The total number of analyses and tests carried out in this period was 13,435 ; in order to facilitate reference these have been grouped under the following headings :—

- | | |
|----------|--|
| Part I. | Reports on samples taken under the Food and Drugs Act, 1955. Page 7. |
| Part II. | Report on Heat-treated Milk Samples taken under the Milk (Special Designation) (Pasteurised and Sterilised Milk) Regulations, 1949 to 1953. Page 94. |
| Part III | Report on samples taken under the Fertilisers and Feeding Stuffs Act, 1926. Page 99. |
| Part IV. | Report on Waters, Effluents, etc. Page 106. |
| Part V. | Radioactivity. Page 109. |
| Part VI. | Miscellaneous (including Atmospheric Pollution). Page 115. |

The total number of samples from all sources examined during the year is the second highest recorded for the laboratory and is over double the number examined annually in any year prior to 1947. The number of samples examined for the County under the Food and Drugs Act and the Fertilisers and Feeding Stuffs Act (excluding, however, milk samples submitted for Phosphatase, Methylene Blue or Turbidity Tests) was 8,329. Your analyst was appointed Public Analyst and Official Agricultural Analyst for the County of Westmorland as from the 1st November, 1958, and the number of Food and Drug samples submitted by the 11 Autonomous Food and Drugs Authorities, for which he now acts as Public Analyst, was 2,115.

The number of Food and Drugs samples (excluding appeal-to-cow samples) submitted by the County Sampling Officers during the year 1958 was 8,225, as against 8,239 during the previous year and 8,215 in the year 1956 ; the rate of samples per 1,000 of the population was 5·81 in the year under review, 5·88 in 1957 and 5·94 in 1956.

The number of County Food and Drugs samples has, therefore, been maintained well above the level reached in 1947 (6,819). Prior to 1947, the highest figure was 5,263 in the year 1933. During the year the number of samples found to be adulterated or unsatisfactory was 405 ; this corresponds to an adulteration rate of 4·9 per cent., as against 4·2 per cent. in the year 1957, and 4·1 per cent. in the year 1956. Table 4 gives the percentage adulteration for the last 10 years and it will be seen that there has been an appreciable drop over that period compared with the years 1941 to 1948 when the adulteration rate varied from 9·3 to 5·7 per cent. Viewed in the light of the figures for the last 10 years the adulteration rate for the year, 1958, cannot be regarded as altogether unsatisfactory although it is 0·7 per cent. higher than the previous year and is higher than in the years immediately preceding the war when the percentage adulteration varied from 2·6 to 4·2.

In addition to Food and Drugs samples the County Sampling Officers submitted 1,145 samples of heat-treated milk and one control sample of raw milk for examination by the Phosphatase test, the half-hour Methylene Blue test or by the Turbidity test as against 1,178 samples submitted in the previous year. Of these, six failed to pass the Phosphatase test and one sample failed to pass the statutory Methylene Blue test, the corresponding figures for the year 1957, being 10 and 10. The number of Specified Areas in the County in which only designated milks can be sold is continually increasing due to the making of further Milk (Special Designations) (Specified Areas) Orders, two more of which affecting the County came into operation during the year under review. By the end of 1958, a total of 80 of the 93 County Districts in the County Food and Drugs Area had become Specified Areas. As a result of this policy on the part of the Government, more and more milk sold under special designations is being consumed and in view of the fact that it is the duty of the Food and Drugs Authority to enforce the provisions of Section 37 of the Food and Drugs Act, 1955, it follows that an increased number of samples is now being taken by County Sampling Officers in the County Districts concerned for submission to the County Laboratory for examination by the statutory Phosphatase, Half-hour Methylene Blue or Turbidity tests.

As usual some two-thirds of the Food and Drugs samples submitted by the County Sampling Officers consisted of samples of milk. Of 5,385

milk samples, 231 were found to be adulterated which represents an adulteration rate of 4·3 per cent. The corresponding figure for the year 1957 was 3·5 per cent. and for the year 1956 it was 3·7 per cent. Milk adulteration in the County of Lancaster has, in general, shown consistent and appreciable decreases since the year 1946. It is reasonable to assume that these decreases are in some measure due to the increased sampling which has occurred since that year.

The adulteration rate for samples other than milk was 6·1 per cent. and is 0·5 per cent. higher than that obtained in the year 1957 when the figure was 5·6 per cent. The adulteration rate for the last 10 years has varied from 2·8 to 6·1 per cent., the former figure in the year 1950 and the latter in the year 1958. The commodities which showed a relatively high proportion of unsatisfactory samples and, therefore, contributed especially to the adulteration rate included flour, ice-cream, sausages, tincture of iodine, samples containing extraneous matter and samples whose labels did not conform to the requirements of the Labelling of Food Order. An examination, however, of table 25 and the sections of the report concerned with the commodities just mentioned will bring to light the fact that many of the samples reported as unsatisfactory showed only slight irregularities in composition or minor infringements of labelling requirements.

Several new Statutory Regulations which affect the work of the Public Analyst have been made in the year under review. The Therapeutic Substances (Supply of Substances for Analysis) Regulations relax the restriction on the sale and supply of Penicillin and certain other substances to make it possible for Public Analysts and Sampling Officers to obtain them for purposes of analysis. An amendment to the Labelling of Food Order revokes that section of the principle Order which prohibited the labelling of a liquor as a cocktail or mixture containing spirits unless it contained not less than 40 per cent. proof spirit. Such mixtures must still, however, be labelled with a declaration of alcohol content. Prior to the year 1958 citrus fruits were only permitted to contain diphenyl if it had been derived from individual wrappers impregnated with not more than a specified amount of the chemical. Two amendments to the Public Health (Preservatives, etc., in Food) Regulations now permit citrus fruits to contain specified amounts of diphenyl and/or ortho-phenylphenol and apples, pears, pineapples, peaches and melons to contain ortho-phenylphenol; the amounts of both chemicals being specified for the actual fruits and not for the wrappers. The Antioxidant in Food Regulations came into operation on the 6th September, 1958, and these permit certain gallates and butylated hydroxyanisole and butylated hydroxytoluene to be used within prescribed limits in edible oils and fats, vitamin oils and concentrates, butter for manufacturing purposes and in essential oils and their flavouring constituents. The

amounts of the antioxidants prescribed vary from 80 to 300 parts per million in oils and fats but essential oils may contain as much as 1,000 parts per million.

During the year under review, 68 samples from all sources, including Autonomous Authorities, were reported upon adversely because they contained foreign matter and a further 21 samples were found to contain insects or insect remains. The corresponding figures for the year 1957 were 45 containing foreign matter and eight containing insects. There has, therefore, been a considerable increase in the numbers of unsatisfactory samples of this description. Many of the samples are described in the appropriate sections of the report and it will be seen that the foreign substances found to be present were very varied in character.

In the report for the year 1957, mention was made of a summons relating to a fragment of broken glass found in a bottle of School milk but the Magistrates dismissed the case as they considered that the glass did not affect the substance of the milk. In view of the importance of this matter, the County Council entered an Appeal by way of case stated which was heard during the year under review. The Divisional Court allowed the Appeal together with £105 costs and remitted the case to the Magistrates Court with a direction that the offence was proved. The Magistrates then fined the defendant company £2 and £7 costs.

As in previous years it has been found that a number of prepacked samples did not conform to the requirements of the Labelling of Food Order and brief details of the more interesting of these will be found in the section of the report dealing with the Order and in table No. 25. Reference to the section dealing with Ice-Cream shows that the composition of this commodity has been well maintained above the level imposed by the first Food Standards (Ice-Cream) Order which was made in the year 1951. In the report for the year 1957, mention was made of amendments proposed by the Food Standards Committee for the revision of the Food Standards (Ice-Cream) Order. These proposals form the basis of two new Regulations made in March, 1959, which, in addition to a standard for ordinary Ice-Cream, prescribe standards for Dairy Ice-Cream and for Milk Ice and also impose restrictions on the labelling of Ice-Cream.

In view of the hazards due to radioactivity and the slight but nevertheless growing contamination of our environment by man-made radioactivity which, in turn, could affect our water supplies and food, your Committee, during the year under review, authorised the County Laboratory to obtain certain equipment for detecting and determining beta and gamma radioactive isotopes. This was set up in September and since that time has been almost continually in use testing for radioactivity in samples of rainwater, drinking water, milk and other foods. In the last four months of the year 44 samples were examined and details of the results

obtained together with a brief account of the significance of radioactive contamination, particularly by Strontium 90, will be found in Part V of this report.

Part VI of the report is concerned with samples of a miscellaneous nature which cannot be conveniently included in previous sections of the report. Investigations which may be of interest include the work done for certain authorities on atmospheric pollution, the examination of milk bottles and foods contaminated by foreign matter, the analysis of samples submitted under the Pharmacy and Poisons Act by the Weights and Measures Department of the County Council and the examination of samples submitted in connection with central purchasing.

The number of samples submitted to the County Laboratory during the year under review has again placed very heavy demands on all members of the staff and it is only by their efficient and loyal assistance that the large volume of work entailed has been successfully carried out. The ready co-operation of the Sampling Officers both of the County and of the Autonomous Food and Drugs Authorities has also contributed, in no small measure, to the smooth running of the laboratory.

In conclusion, I wish to tender to the members of the County Council and to the County Medical Officer of Health, my most grateful thanks for their continued encouragement and support.

I have the honour to be, Mr. Chairman, Ladies and Gentlemen,

Your obedient Servant,

GEO. H. WALKER,

County Analyst.

The County Laboratory,
County Hall,
Preston.

23rd May, 1959.

TOTAL SAMPLES EXAMINED.

During the year 1958, a total of 13,435 analyses and tests have been carried out in the County Laboratory. They are classified in the following table :—

Table 1.

County Samples—

Food and Drugs Act (including 5,385 milks)	...	8,225
Appeal-to-Cow	... ..	55
Fertilisers and Feeding Stuffs Act, 1926	...	49
Food and Drugs Act samples (including five Appeals-to-Cow) from the following autonomous Food and Drugs Authorities—		
Borough of Chorley	... ..	67
Borough of Darwen	... ..	80
Urban District of Huyton-with-Roby	...	311
City of Lancaster	... ..	105
Borough of Leigh	... ..	141
Borough of Middleton	... ..	241
Borough of Morecambe and Heysham	...	164
Urban District of Newton-le-Willows	...	27
County Borough of Preston	... ..	644
County Borough of Southport	... ..	301
County of Westmorland	... ..	34
	—	2,115
Fertilisers and Feeding Stuffs Act, 1926—		
Preston County Borough	... ..	20
Southport County Borough	... ..	13
County of Westmorland	... ..	4
Other Samples (from all sources including the County)—		
Potable Waters	... ..	58
Other Waters and Effluents	... ..	37
Miscellaneous	... ..	414
Milk Samples.—Phosphatase Tests	... ..	1,130
Milk Samples.—Methylene Blue Tests	... ..	1,128
Milk Samples.—Turbidity Tests	... ..	187
Total number examined		13,435*

*Forty-four of these samples were examined for Radioactivity.

The total number of samples analysed in the year is compared with the total numbers similarly classified for the previous years 1912–1957, in table 2. It will be seen from the table that, since the year 1912, the grand total of samples examined amounts to 308,600.

Table 2.

Total number of Samples examined during the years 1912 to 1958.

Year.	County Food and Drugs.	Other Authorities Food and Drugs.	County Appeal-to-cow Samples.	Other Authorities Appeal-to-cow Samples.	Fertilisers and Feeding Stuffs Act.	Waters and Effluents.	Miscellaneous and Departmental.	Total Phosphate, Methylene Blue and Turbidity Tests	Total.
1912-1946	155719	2888	2126	58	752	2320	2821	67	166751
1947	6819	962	110	13	34	48	35	1062	9083
1948	6958	783	59	13	31	46	88	1052	9030
1949	7700	1060	53	10	52	77	98	1425	10475
1950	8104	1040	38	1	58	113	149	1595	11098
1951	8501	1337	28	9	54	196	203	1602	11930
1952	8622	1418	40	12	53	126	208	1745	12224
1953	8635	1345	50	11	59	112	237	1797	12246
1954	8089	1612	67	3	62	84	250	1949	12116
1955	8373	1983	49	5	76	118	288	2463	13355
1956	8215	2177	27	11	59	120	328	2508	13445
1957	8239	2007	77	2	80	121	387	2499	13412
1958	8225	2110	55	5	86	95	414	2445	13435
1912-1958	252199	20722	2779	153	1456	3576	5506	22209	308600

PART I.—SAMPLES TAKEN UNDER THE FOOD AND DRUGS ACT, 1955.

The Food and Drugs Act, 1955, came into operation on the 1st January, 1956, and it consolidates and places on a permanent footing those parts of the Food and Drugs Act, 1938 and post war Acts and Regulations which were in operation up to the 1st January, 1956.

During the year under review, several new Regulations have been made which relate to the work of the Public Analyst. The following list contains the more important of these :—

The Therapeutic Substances (Supply of Substances for Analysis) Regulations, 1958.

The Labelling of Food (Amendment) Regulations, 1958.

The Public Health (Preservatives, etc., in Food) (Amendment) Regulations, 1958.

The Public Health (Preservatives, etc. in Food) (Amendment No. 2) Regulations, 1958.

The Antioxidant in Food Regulations, 1958.

The Milk (Special Designations) (Specified Areas) Order, 1958.

The Milk (Special Designations) (Specified Areas) (No. 2) Order, 1958.

The two specified areas orders are referred to in Part II of this report while the five new regulations are described briefly in the following paragraphs.

Section 9 of the Therapeutic Substances Act, 1956, imposes restrictions on the sale and supply of Penicillin and certain other therapeutic substances which come within the provisions of Part II of the Act. The Therapeutic Substances (supply of Substances for Analysis) Regulations, 1958, now make it possible for Public Analysts, Agricultural Analysts, sampling officers and certain other persons to obtain these substances for purposes of analysis.

The Labelling of Food (Amendment) Regulations, 1958, revoke Article 8 (*d*) of the Labelling of Food Order, 1953, which prohibited the labelling of a liquor as a Cocktail or as a mixture containing spirits unless it contained not less than 40 per cent. proof spirit. It will still be necessary, however, for these substances to be labelled with a declaration of alcohol content.

Citrus fruits, prior to 14th August, 1958, were only permitted to contain diphenyl if they had been wrapped outside the United Kingdom in wrappers impregnated with not more than 40 milligrammes diphenyl per 100 square inches. The Public Health (Preservatives, etc., in Food) (Amendment) Regulations, 1958, now permit citrus fruits to contain not more than 100 parts per million of diphenyl or not more than 70 parts per million of ortho-phenylphenol or an amount of a mixture of the two substances which when expressed as percentages of their respective limits does not exceed 100. The new Regulations will, therefore, now permit citrus fruits to be imported in packages impregnated with diphenyl by other means than individual wrappers (reference to a technical infringement of the regulations by the use of an impregnated brown paper liner in the crate instead of individual wrappers was made on page 84 of this report for the year 1957). As indicated above, the new Regulations permit another chemical besides diphenyl to be present in citrus fruit and the standards now specified are far more satisfactory in that they apply to the actual fruit and not merely to the wrapper.

The permitted use of ortho-phenylphenol in fruit was further extended during the year 1958 by the Public Health (Preservatives, etc., in Food) (Amendment No. 2) Regulations, 1958, which came into operation on the 24th December of that year and which now allow certain non-citrus fruits and foods in which they are present as ingredients to contain this chemical. The Regulations allow apples, pears and pineapples to contain not more than 10 parts per million of ortho-phenylphenol, peaches not more than 20 parts per million and melons not more than 125 parts per million. Proportionate quantities may be present in foods containing these fruits with the provision that in the case of melon the maximum tolerance shall be 10 parts per million calculated on the melon content.

The recommendations of the Food Standards Committee of the Ministry of Food with regard to the use of antioxidants in foods have been adopted, with minor changes, in the Antioxidant in Food Regulations, 1958. These Regulations permit the use of certain antioxidants, *viz.*, propyl, octyl and dodecyl gallates and butylated hydroxyanisole and butylated hydroxytoluene, within prescribed limits in a number of specified foods. The latter include edible oils and fats, vitamin oils and concentrates, butter for manufacturing purposes, essential oils and their flavouring constituents. In addition where food contains milk-fat by reason of the use of a dairy product as an ingredient, the milk-fat may contain antioxidants of a description and in an amount permitted in an equal proportion of edible fat. The prescribed amounts of antioxidants or mixture of antioxidants permitted in edible oils, vitamin oils and manufacturing butter vary from 80 to 300 parts per million by weight but essential oils and their flavouring constituents may contain as much as 1,000 parts per million of the permitted antioxidants. The container of any antioxidant mixture sold for use in the preparation of food must be labelled in a prescribed manner with the percentage by weight and a correct description of each antioxidant present together with a correct description of any other ingredients present in the container. The Regulations also provide that where food has been certified by a Public Analyst as containing antioxidant not permitted by the Regulations that food may be treated for the purpose of Section 9 of the Food and Drugs Act as being unfit for human consumption. The expression "Antioxidant" as defined in the Regulations does not include the following substances:—Lecithin, Ascorbic Acid, Tocopherols, Citric Acid, Tartaric Acid, Phosphoric Acid or any permitted preservative. Finally, it is laid down that the Public Health (Preservatives, etc., in Food) Regulations, 1925, as amended, shall not apply in relation to any antioxidant or any food containing any antioxidant.

In addition to the above mentioned Regulations, the Minister of Agriculture, Fisheries and Food issued three circular letters which are of interest to food and drugs authorities during the year. The first of these

related to copper in foods and stated that he and the Minister of Health accept the view of the Food Standards Committee, contained in the revised report published in February, 1956, that it is not necessary, at present, to make Statutory Standards for copper in Foods (except those already in force in the Food Standards (Edible Gelatine) Order, 1951, and the Food Standards (Tomato Ketchup) (Amendment) Regulations, 1956). Notwithstanding this, the Committee did make certain recommendations as to limits for copper which are consistent with good commercial practice. The general limits are :—two parts per million for beverages ready to drink and 20 parts per million for other foods ; there are also a number of special limits which vary from seven parts per million in the case of wines, beer, etc., to as much as 300 parts per million for solid pectin.

Another Circular letter relates to the dossier issued by the Ministry of Agriculture, Fisheries and Food with regard to chemical compounds used in agriculture and food storage. The dossier contains up to date recommendations, based on the advice of the Advisory Committee on Poisonous Substances used in Agriculture and Food Storage, in regard to the protection of the users of the chemicals and the protection of consumers of the foods and also makes recommendations as to the rate and frequency of application of the individual chemicals to crops. The dossier was first issued in January, 1958, and reviewed in September, 1958 ; it now contains references to over 30 chemicals.

The third Circular letter, dated 30th June, 1958, refers to a previous Circular letter, dated 19th July, 1954, which requested food and drugs authorities to arrange for copies of Public Analysts' quarterly reports to include particulars of the meat content and price of sausage samples which had been analysed. The letter states that the information provided was of great value to both the Minister and to the Food Standards Committee in the preparation of their report on sausages but it is felt that the returns may now be discontinued. This action presumably follows the statement by the Minister in the House of Commons on 31st March, 1958, that because of technical difficulties and because of established trade custom he was not able to take any action on the Committee's report which was in favour of statutory minimum standards for sausages.

On the other hand, it is noteworthy that the Food Manufacturers Federation Incorporated and the Association of Public Analysts arrived at an agreement in July, 1958, operative from 1st July, 1959, on the composition and labelling of chopped, minced or flaked poultry and meat lines in containers not exceeding three ounces which are not covered by the Code of Practice for Meat Pastes. Products sold under an unqualified description, such as "Minced Chicken," "Chopped Ham," etc., shall contain not less than 95 per cent. of meat. Products sold under a

qualified description, such as "Minced Turkey in Jelly," "Chopped Chicken in Chicken Stock." etc., shall contain not less than 70 per cent. meat. Descriptions such as "in natural juices" or "in natural stock" are regarded as inappropriate where any added water is present. The agreement even goes so far as to include conversion factors for calculating the lean meat content in terms of the appropriate variety of meat.

Towards the end of the year 1958, the terms of reference of the Food Standards Committee of the Ministry of Agriculture, Fisheries and Food were revised and are now as follows :—

"To advise the Secretary of State for Scotland, the Minister of Agriculture, Fisheries and Food, the Minister of Health, and as respects Northern Ireland the Secretary of State for the Home Department, on the composition, description, labelling and advertising of food with particular reference to the exercise of the powers conferred on Ministers by Sections 4, 5 and 7 of the Food and Drugs Act, 1955, and the corresponding provisions in enactments relating to Scotland and Northern Ireland."

The new terms of reference are designed to give the Committee more scope to make recommendations with regard to food labelling and advertising; previously the Committee was limited in this respect to foods which were the subject of statutory standards of composition. Another point is that questions relating to liquid milk are no longer excluded from the terms of reference.

Following the decision of the General Medical Council that, in order to keep abreast of the rapidly growing list of new medicinal drugs and preparations, new editions of the British Pharmacopoeia should be published every five years, a new edition was published during the year under review and became official on the 1st September, 1958. The last edition was the B.P. 1953, although an extensive addendum was published in the year 1955. The new B.P. now contains a total of 826 monographs of which 160 are new. For the first time radioactive substances are included and there are monographs, incorporating official assays, for solutions and injections of sodium radio-iodide (I131) and sodium radio-phosphate (P32). Among the long list of new additions may also be mentioned, carbromal, chlorcyclizine hydrochloride and chlorpromazine hydrochloride. Notwithstanding the considerable increase in size of the new Pharmacopoeia the list of deletions is quite formidable and includes 137 substances and preparations. The deletions include many long established preparations such as Seidlitz Powder, Compound Liquorice Powder, Gregory's Powder, liquid Glucose and Boric Acid Ointment. Phenylbutazone is also among the deletions although this substance was only included for the first time in the 1955 Addendum to the last B.P. Limits for the composition of preparations have been altered in certain instances, as, for

example, in the case of Tincture of Iodine. Methods of assay have been amended to include modern techniques where appropriate ; for example, electrometric titration is now adopted in the official assays of sulphonamides ; certain extraction methods have been replaced by titration in glacial acetic acid with standard perchloric acid, as in the assays of cinchocaine hydrochloride and adrenaline ; phenobarbitone and amylobarbitone are now assayed by titration with a standard solution of lithium methoxide and the use of spectrophotometric methods has been extended particularly in the examination of preparations of steroids.

*Particulars of Samples of Food and Drugs submitted by County
Sampling Officers.*

In table 3 there is a list of all the articles of food and drugs which were submitted during the year, 1958, from the County of Lancaster together with the number of each kind and also the number found to be adulterated.

Table 3.

Samples examined under the Food and Drugs Act during 1958.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Almonds, Ground	17	...	17	...	3	...	3
Ammoniated Mercury Ointment	...	3	...	3	...	2	...	2
Anchovies, Essence of	1	...	1	...	...	...	...
Angelica	3	...	3	...	...	...	...
Arrowroot	6	...	6	...	...	...	...
Aspirin Tablets	1	...	1	...	...	...	...
Aspirin Tablets, Buffered	1	...	1	...	...	...	...
Baby Food, Canned (Rice, etc.)	6	...	6	...	2	...	2
Backache Pills	1	...	1	...	...	...	...
Bacon	30	...	30	...	...	...	...
Baking Powder	16	...	16	...	...	...	...
Barley	33	...	33	...	...	...	...
Biscuits	9	...	9	...	1	...	1

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Blackcurrant Syrup	...	1	...	1	...	...	...	...
Blancmange Powder	...	16	...	16	...	...	...	...
Blauds Pills (includes 2 with Cascara)	11	...	11	...	1	...	1
Borax	3	...	3	...	...	...	...
Boric Acid Ointment	...	10	...	10	...	...	...	...
Boric Acid	5	...	5	...	...	...	...
Brandy ...	3	...	...	3	...	...	...	...
Bread	33	...	33	...	11	...	11
Bread, Brown	7	...	7	...	...	...	...
Bread, Fancy ... (Fruit Malt Loaf)	...	3	...	3	...	2	...	2
Breakfast Cereals	2	...	2	...	...	...	...
Butter ...	1	59	...	60	1	2	...	3
Caffeine Tablets	1	...	1	...	...	...	...
Cake Mixture, Sweetened	2	...	2	...	1	...	1
Calves Feet Jelly	1	...	1	...	...	...	...
Camphorated Oil	16	...	16	...	...	...	...
Cascara Tablets, B.P.C.	1	...	1	...	...	...	...
Cassia, Ground	1	...	1	...	...	...	...
Castor Oil	23	...	23	...	...	...	...
Cheese (including Processed Cheese)	...	25	...	25	...	...	...	...
Cheese Spread	6	...	6	...	...	...	...
Cherry Brandy	1	...	1	...	1	...	1
Chicken Fillets, Canned	2	...	2	...	2	...	2
Chicken, Boned, Canned	1	...	1	...	...	...	...

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Chicken, Chopped, Canned	1	...	1	...	...	...	...
Chicken, Minced, Bottled	1	...	1	...	...	...	...
Chicory and Coffee Extract Mixture, dry	3	...	3	...	...	...	...
Chlorophyll Tablets (Compound)	1	...	1	...	...	...	...
Chocolate, Drinking	...	9	...	9	...	...	...	...
Chutney	4	...	4	...	...	...	...
Cinnamon, Ground	...	7	...	7	...	...	...	...
Cloves, Ground	2	...	2	...	...	...	...
Cocoa	12	...	12	...	...	...	...
Coconut Desiccated	...	2	...	2	...	...	...	...
Cod Liver Oil	6	...	6	...	2	...	2
Cod Liver Oil Emulsion	4	...	4	...	1	...	1
Codeine Tablets, Compound	13	...	13	...	...	...	...
Coffee	32	...	32	...	...	...	...
Coffee and Chicory	...	4	...	4	...	...	...	...
Coffee and Chicory Extract Mixture, dry	3	...	3	...	...	...	...
Coffee and Chicory Essence, Liquid, Sweetened	7	...	7	...	...	...	...
Coffee Extract, dry	...	2	...	2	...	...	...	...
Condiment, Non-brewed	7	...	7	...	2	...	2
Cooking Fat	22	...	22	...	...	...	...
Cooking Oil	1	...	1	...	...	...	...
Cornflour	13	...	13	...	...	...	...
Cough Medicine	11	...	11	...	1	...	1

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Cream, Single and Double	12	...	12	...	...	...	...
Cream, Clotted	1	...	1	...	...	...	...
Cream, Sterilised	25	...	25	...	...	...	...
Cream, Imitation, Canned	1	...	1	...	...	...	...
Cream of Tartar	20	...	20	...	...	...	...
Crumpets	1	...	1	...	...	...	...
Curry Powder	11	...	11	...	...	...	...
Custard Mix	1	...	1	...	...	...	...
Custard Powder	24	...	24	...	...	...	...
Cut Mixed Peel and Candied Peel	15	...	15	...	3	...	3
Dripping	16	...	16	...	3	...	3
Epsom Salts	13	...	13	...	...	...	...
Epsom Salts Tablets, Compound	2	...	2	...	...	...	...
Ferrous Fumarate Tablets	1	...	1	...	...	...	...
Fever Mixture	2	...	2	...	...	...	...
Figs, Syrup of	7	...	7	...	...	...	...
Fish Cakes	2	...	2	...	...	...	...
Fish, Canned	29	...	29	...	2	...	2
Fish Fingers, Frozen	1	...	1	...	...	...	...
Fish Paste	2	18	...	20	2	2	...	4
Fish, Potted	1	...	1	...	...	...	...
Flavouring Materials	13	...	13	...	...	...	...
Flavoured Straws	1	...	1	...	1	...	1
Flour	31	...	31	...	6	...	6
Flour, Self-raising	36	...	36	...	...	...	...

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Flour Confectionery (Jam Tarts, etc.)	...	58	...	58	...	9	...	9
Friar's Balsam	1	...	1	...	...	...	...
Fruit, Bottled in Syrup	2	...	2	...	...	...	...
Fruit, Canned	44	...	44	...	2	...	2
Fruit Curd	47	...	47	...	...	...	...
Fruit, Dried	64	...	64	...	...	...	...
Fruit, Fresh (Apples, Oranges, etc.)	32	...	32	...	1	...	1
Fruit Juices (Bottled and Canned)	4	...	4	...	...	...	...
Gelatine	1	...	1	...	...	...	...
Gin ...	13	...	...	13	...	...	...	...
Ginger, Ground	9	...	9	...	...	...	...
Glucose Tablets	1	...	1	...	...	...	...
Glycerin	30	...	30	...	2	...	2
Glycerin of Borax	11	...	11	...	3	...	3
Golden Raising Powder	7	...	7	...	...	...	...
Gravy Browning	36	...	36	...	3	...	3
Gravy Powder	1	...	1	...	...	...	...
Gravy Salt	1	...	1	...	...	...	...
Gripe Water	3	...	3	...	1	...	1
Halibut Liver Oil Capsules	2	...	2	...	...	...	...
Halibut Liver Oil and Orange	1	...	1	...	...	...	...
Headache Powders	6	...	6	...	4	...	4
Headache Tablets	2	...	2	...	...	...	...
Health Drink	1	...	1	...	...	...	...
Health Salts	11	...	11	...	...	...	...

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Herbal Medicine	1	...	1	...	...	...	...
Honey	20	...	20	...	...	...	...
Hypophosphites, Compound Syrup of	8	...	8	...	1	...	1
Ice-Cream ...	4	59	...	63	3	9	...	12
Ice-Cream, Cold Mix Powder	1	...	1	...	...	...	...
Ice Lollies	4	...	4	...	2	...	2
Indian Brandee	1	...	1	...	...	...	...
Indigestion Tablets	...	2	...	2	...	1	...	1
Indigestion Mixture	...	3	...	3	...	...	...	...
Influenza Powders...	...	1	...	1	...	...	...	...
Instant Icing	1	...	1	...	...	...	...
Invalid Food	1	...	1	...	...	...	...
Iodine, Ticture of (includes 1 colourless)	29	...	29	...	7	...	7
Jam	17	...	17	...	...	...	...
Jelly, Table	35	...	35	...	5	..	5
Lard	35	...	35	...	...	...	...
Laxative Sweetmeats	2	...	2	...	1	...	1
Linctus of Codeine...	...	1	...	1	...	1	...	1
Macaroni, Spaghetti and similar products	2	...	2	...	...	...	...
Macaroni and Cheese	...	2	...	2	...	...	...	...
Mace, Ground	1	...	1	...	...	...	...
Magnesia, Milk of	1	...	1	...	...	...	...
Malt Extract and Vitamin Compound	3	...	3	...	1	...	1

Table 3—continued.

Samples.	Number examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Malt Extract with Cod Liver Oil	19	...	19	...	1	...	1
Malt, Milk and Cocoa Beverage	13	...	13	...	1	...	1
Margarine	40	...	40	...	...	...	...
Marmalade	1	...	1	...	...	...	...
Marzipan	3	...	3	...	...	...	...
Marzipan Substitute	...	2	...	2	...	...	...	...
Meat, Frozen	1	...	1	...	...	...	...
Meat, Canned	30	...	30	...	1	...	1
Meat Paste...	...	11	...	11	...	...	...	...
Meat Pies	3	...	3	...	1	...	1
Meat and Potato Pies	2	...	2	...	2	...	2
Meat Pudding, Canned	1	...	1	...	...	...	...
Meat Pudding Uncooked	1	...	1	...	...	...	...
Meat and Vegetables, Canned	1	...	1	...	...	...	...
Medicinal Glucose	1	...	1	...	...	...	...
Meringue Powder	1	...	1	...	...	...	...
Milk... ...	3,097	1,971	317	5,385	113	107	11	231
Milk, Channel Islands ...	171	33	...	204	7	...	...	7
Milk, Condensed, Full Cream, Sweetened	1	...	1	...	...	...	...
Milk, Condensed, Special Full Cream, Sweetened	...	8	...	8	...	...	...	...
Milk, Condensed, Full Cream, Unsweetened	17	...	17	...	1	...	1

Table 3.—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Milk, Condensed, Skimmed Sweetened	9	...	9	...	1	...	1
Milk, Malted	5	...	5	...	1	...	1
Milk, Dried...	2	2	...	...	1	1
Milk Shake Powders	...	2	...	2	...	...	...	...
Milk Shake Syrup	1	...	1	...	...	...	...
Milk, Skimmed and Oil Compound, Canned	2	...	2	...	...	...	...
Mincemeat (includes 1 canned)	30	...	30	...	3	...	3
Mint Jelly	1	...	1	...	...	...	...
Mint Sauce...	1	...	1	...	...	...	...
Muffins	3	...	3	...	2	...	2
Mustard Compound	...	10	...	10	...	...	...	...
Mustard, Liquid	7	...	7	...	...	...	...
Nasal Inhaler	1	...	1	...	...	...	...
Nutmeg, Ground	7	...	7	...	...	...	...
Oatmeal	28	...	28	...	...	...	...
Oats, Breakfast	1	...	1	...	...	...	...
Olive Oil	21	...	21	...	...	...	...
Pancake and Yorkshire Pudding Mixture	...	4	...	4	...	...	...	...
Paraffin, Liquid	39	...	39	...	...	...	...
Parrish's Chemical Food	10	...	10	...	1	...	1
Peanut Butter	1	...	1	...	...	...	...
Penicillin Tablets	...	9	...	9	...	...	...	...
Pepper, White	36	...	36	...	...	...	...
Pickles	50	...	50	...	1	...	1

Table 3.—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Pie Filling, Lemon Flavour	3	...	3	...	...	...	...
Pimento, Ground	1	...	1	...	...	...	...
Polony	2	...	2	...	...	...	...
Pork and Sage Croquettes	1	...	1	...	...	...	...
Potato Chips	1	...	1	...	...	...	...
Pudding (Christmas, etc.)	21	...	21	...	2	...	2
Pudding Mixture (Sweetened and Unsweetened)	9	...	9	...	...	...	...
Puff Pastry	1	...	1	...	...	...	...
Puff Pastry Mixture	1	...	1	...	...	...	...
Raspberry Vinegar and Olive Oil	1	...	1	...	...	...	...
Rice	10	...	10	...	3	...	3
Rice, Flaked	1	...	1	...	...	...	...
Rice Ground	4	...	4	...	...	...	...
Rose Hip Syrup	2	...	2	...	1	...	1
Rum ...	8	2	...	10	...	...	...	...
Rum Butter	2	...	2	...	...	...	...
Rusks	1	...	1	...	...	...	...
Saccharin Tablets	12	...	12	...	1	...	1
Sago...	8	...	8	...	1	...	1
Salad Cream	16	...	16	...	...	...	...
Salad Oil	1	...	1	...	...	...	...
Salt	24	...	24	...	...	...	...
Sauce	25	...	25	...	1	...	1
Sausages, Beef	25	...	25	...	3	...	3
Sausages, Pork	31	...	31	...	8	...	8
Sausages, Canned	2	...	2	...	1	...	1

Table 3.—continued.

Samples.	Number examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Sausages, Canned with Beans	2	...	2	...	...	...	...
Sausage Meat, Beef	1	...	1	...	...	...	...
Sausage Meat, Pork	1	...	1	...	1	...	1
Sausage Rolls	4	...	4	...	...	...	...
Sedative Tablets	4	...	4	...	...	...	...
Seidlitz Powders	7	...	7	...	...	...	...
Seidlitz Powders, Double Strength	1	...	1	...	1	...	1
Seidlitz Powders, Extra Strong	5	...	5	...	1	...	1
Semolina	10	...	10	...	...	...	...
Sleeping Tablets	1	...	1	...	...	...	...
Slimming Tablets	1	...	1	...	...	...	...
Sodium Bicarbonate	19	...	19	...	...	...	...
Soft Drinks, to be diluted	11	...	11	...	...	...	...
Soft Drinks, Mineral Waters	15	...	15	...	4	...	4
Soft Drinks, Orange Drink	11	...	11	...	...	...	...
Soft Drink Powder and Crystals	5	...	5	...	1	...	1
Soup, Canned	4	...	4	...	...	...	...
Soup Mixture	1	...	1	...	...	...	...
Spice, Mixed, Ground	14	...	14	...	...	...	...
Spice, Pickling	2	...	2	...	...	...	...
Sponge Cake and Sponge Pudding Mixture, Sweetened	3	...	3	...	...	...	...
Spread (Invert Sugar and Honey)	2	...	2	...	...	...	...
Stout	2	...	2	...	...	...	...

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Suet, Shredded	18	...	18	...	...	...	...
Sugar	35	...	35	...	1	...	1
Sugar, Icing	7	...	7	...	...	...	...
Sulphur and Yeast Tablets	1	...	1	...	...	...	...
Sweets (including Chocolates and Sweets containing Butter)	43	...	43	...	...	...	...
Sweetmeat	1	...	1	...	...	...	...
Syrup	16	...	16	...	...	...	...
Tapioca	14	...	14	...	1	...	1
Tea	41	...	41	...	...	...	...
Teacake Sandwich with Jam	1	...	1	...	1	...	1
Teething Powders	17	...	17	...	...	...	...
Throat Lozenges	2	...	2	...	...	...	...
Throat Mixture	1	...	1	...	...	...	...
Tomatoes, Canned...	...	2	...	2	...	...	...	...
Tomato Juice, Canned	1	...	1	...	...	...	...
Travel Sickness Tablets	7	...	7	...	...	...	...
Treacle and Molasses	24	...	24	...	...	...	...
Trifle Pack	1	...	1	...	...	...	...
Turkey, Minced, Bottled	2	...	2	...	...	...	...
Vegetables, Canned	37	1	38	...	2	1	3
Vegetables, Dried (Peas, etc.)	40	...	40	...	2	...	2
Vegetables, Fresh	1	...	1	...	...	...	...
Vegetables, Frozen	2	...	2	...	...	...	...
Vinegar	20	...	20	...	...	...	...

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Vinegar, Malt, Distilled	1	...	1	...	...	...	...
Vitamin A and D Compound Syrup	1	...	1	...	...	...	...
Vitamin Capsules and Tablets	11	...	11	...	1	...	1
Whisky ...	38	...	...	38	...	...	...	...
White Fish Caviar...	...	1	...	1	...	1	...	1
Wine (British Sherry, British Ruby, etc.)	14	...	14	...	1	...	1
Witch Hazel, Extract of	1	...	1	...	...	...	...
Yeast, Dried Bakers	1	...	1	...	...	...	...
Yeast, Brewers	2	...	2	...	...	...	...
Yeast Tablets	1	...	1	...	...	...	...
Zinc, Boric and Castor Oil Ointment	2	...	2	...	...	...	...
Zinc and Castor Oil Ointment	2	...	2	...	...	...	...
Zinc Ointment	13	...	13	...	...	...	...
Totals ...	3,337	4,568	320	8,225	126	266	13	405

The Number of Commodities.

The variety of commodities on sale is now very large, and this is reflected in the number of different articles of which samples have been taken and submitted for analysis. Two hundred and sixty-four different commodities consisting of food and drugs were examined during the year.

In order to obtain adequate sampling of the common articles of food it is the practice to issue quarterly lists of samples which assist the sampling officers to correlate their samples one with another and at the same time ensure that each area is satisfactorily sampled in respect of any particular commodity. Due to the desirability of allowing considerable latitude in the sampling of other articles where this may be indicated in the public interest, the variety of samples actually examined is considerably increased by the inclusion of commodities in less common demand.

Total Adulteration.

During the year under review, 8,225 samples of food and drugs were submitted for examination under the Act, and of these 405 were reported upon adversely; the total adulteration was, therefore, 4.9 per cent. This represents an increase compared with the percentage of adulteration for the previous year (1957) when the figure was 4.2 per cent.

In table 4 the percentages of adulteration are given for the past 10 years. It will be seen that during this period the lowest figure is 4.1 which was reached during the year 1956 and that the average figure is 4.7 per cent. In general, the adulteration during and subsequent to the war was considerably greater than that found in preceding years; while the figure for the year under review cannot be regarded as unsatisfactory when compared with the figures for the last 10 years, it is, however, higher than the adulteration rate for the 10 years 1929-1938, which preceded the war when the percentage adulteration varied from 2.6 to 4.2.

Table 4.

*Percentage of Adulteration of County Samples of Food and Drugs,
1949-1958.*

Year.			Total No. of Samples.	No. of Adulterated Samples.	Percentage of Adulteration.
1949	...	...	7,700	408	5.3
1950	...	...	8,104	363	4.5
1951	...	...	8,501	412	4.8
1952	...	...	8,622	404	4.7
1953	...	...	8,635	386	4.5
1954	...	...	8,089	417	5.1
1955	...	...	8,373	413	4.9
1956	...	...	8,215	340	4.1
1957	...	...	8,239	349	4.2
1958	...	...	8,225	405	4.9
1949-1958	...	...	82,703	3,897	4.7

Analysis of County Food and Drugs Samples.

The point raised in the preceding paragraph is perhaps brought out more clearly in table 5 where the percentage of adulteration over the last 10 years is given side by side with the various types of samples and with the number of samples taken per 100,000 of the population. During the war years the rate of sampling dropped very considerably, in fact for the years 1942-1945 inclusive it was less than half that for the years immediately prior to the war. The total number of samples and the number of samples per 100,000 of the population for the year under review have been well maintained at the level reached during the year 1947 (6,819) and the figures for the last 10 years are much higher than the corresponding figures for any of the previous years in the history of the County Laboratory.

Table 5.

Year.	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Percentage of Adulteration	5.3	4.5	4.8	4.7	4.5	5.1	4.9	4.1	4.2	4.9
Total Samples ..	7,700	8,104	8,501	8,622	8,635	8,089	8,373	8,215	8,239	8,225
Formal Samples ..	3,011	2,798	2,751	2,654	3,220	2,817	3,300	3,474	3,331	3,337
Informal Samples ..	4,254	4,858	5,184	5,313	4,761	4,844	4,744	4,404	4,589	4,568
Private Samples ..	435	448	566	655	654	428	329	337	319	320
Number of Samples per 100,000 of the population	546	566	589	599	598	593	613	594	588	581

Total Adulteration : the County compared with other Areas.

Table 6 gives the percentage of adulteration for the year 1958 for certain other Food and Drugs Authorities whose figures were available at the time of writing. I am indebted to the Public Analysts of the various districts for the information included in this table and also for the figures included in tables 14 and 19. It will be seen that the figure for the County of Lancaster, *viz.*, 4.9 per cent. is higher than the average (3.7 per cent.) for the Authorities mentioned. The range of adulteration for the areas included in the table varied from 6.8 to 1.7 per cent.

Table 6.

Total Adulteration, 1958. Various Districts.

Area.	No. of Samples.	Per cent. of Adult.	Area.	No. of Samples.	Per cent. of Adult.
Durham, County ...	2,573	1.7	Bristol	3,917	1.9
Kent, County ...	4,833	2.1	Leeds	3,593	2.9
Somersetshire, County	3,365	4.6	Leicester	2,499	2.5
Staffordshire, ...	5,822	3.2	Liverpool	4,405	4.9
Worcestershire, ...	5,610	6.8	Manchester	2,961	3.7
Birmingham ...	5,539	6.3	Portsmouth	1,667	3.5

Total Adulteration : England and Wales.

It is interesting to compare the position as regards adulteration in Lancashire, which is 4.9 per cent., with the corresponding figures for the years between the wars for the whole of England and Wales. In table 7 there are given the figures for a long period, 34 years, omitting the years of

both wars. It will be seen that the total adulteration in Lancashire for the year under review is less than the average (6·6 per cent.) for England and Wales for the years between the wars. This is the eleventh occasion since the year 1940 that the adulteration rate for the County has fallen below the average for that of England and Wales for all the years shown in the table, the first occasion being the year 1948, when the total adulteration rate was 5·7 per cent.

Table 7.
Percentage of Adulteration for England and Wales, 1900–1938.

YEAR.	MILK.			TOTAL SAMPLES.		
	Number examined.	Number adulterated.	Per-centage of Adult.	Number examined.	Number adulterated.	Per-centage of Adult.
*1900–1913...	569,916	62,318	10·9	1,250,686	105,076	8·4
1919	57,361	6,374	11·1	101,140	8,313	8·2
1920	62,463	5,797	9·3	111,797	7,903	7·1
1921	61,439	5,290	8·6	113,664	7,582	6·7
1922	60,274	4,624	7·7	113,860	7,106	6·2
1923	59,925	4,684	7·8	114,846	6,980	6·1
1924	62,133	4,773	7·7	118,000	6,987	5·9
1925	61,909	5,163	8·3	118,930	7,714	6·5
1926	62,507	4,625	7·4	120,617	7,044	5·8
1927	63,687	4,398	6·9	124,264	6,787	5·5
1928	67,350	5,542	8·2	129,034	7,524	5·8
1929	68,115	5,293	7·8	133,584	7,260	5·4
1930	69,311	4,581	6·6	136,515	6,496	4·8
1931	70,201	4,507	6·4	136,169	6,324	4·6
1932	72,940	5,307	7·3	137,981	7,019	5·1
1933	74,545	5,760	7·7	138,171	7,601	5·5
1934	76,930	5,506	7·2	140,583	7,451	5·3
1935	78,674	5,798	7·4	143,831	7,972	5·5
1936	80,082	5,706	7·1	146,438	7,802	5·3
1937	82,357	6,107	7·4	151,370	8,401	5·5
1938	80,025	6,141	7·7	149,073	8,433	5·7
Totals ...	1,942,144	168,294	8·7	3,830,553	253,775	6·6

* Figures for 1914–1918 and 1939–1958 inclusive, not available.

Adulteration in County Districts, etc.

There are 93 Districts shown in the Area of the County Food and Drugs authority for the year under review.

Table 8 shows the number of samples taken and the number of adulterated samples in each of the 93 districts together with those relating to 11 autonomous areas. An examination of the table will show that adulteration was nil in 16 of the County Districts as against nil in 18 districts for the year 1957. None of the autonomous areas showed a total freedom from adulteration.

Table 8.

Adulteration in the County Districts and in the areas of 11 Autonomous Food and Drugs Authorities during the year 1958.

District.	Milk.		Other Articles.		Total.	
	Samp-les.	Adult.	Samp-les.	Adult.	Samp-les.	Adult.
Abram U.D.C. ...	11	1	11	0	22	1
Adlington U.D.C. ...	36	8	21	3	57	11
Ashton-in-Makerfield U.D.C. ...	49	1	43	3	92	4
Aspull U.D.C. ...	8	0	16	1	24	1
Atherton U.D.C. ...	64	1	36	1	100	2
Audenshaw U.D.C. ...	32	0	28	6	60	6
Bacup Borough ...	73	0	24	8	97	8
Barrowford U.D.C. ...	16	1	10	0	26	1
Billinge and Winstanley U.D.C. ...	12	0	20	1	32	1
Blackburn R.D.C. ...	61	8	22	5	83	13
Blackrod U.D.C. ...	4	0	7	0	11	0
Brierfield U.D.C. ...	24	1	11	0	35	1
Burnley R.D.C. ...	55	2	26	0	81	2
Carnforth U.D.C. ...	17	0	23	0	40	0
Chadderton U.D.C. ...	86	1	88	8	174	9
Chorley R.D.C. ...	134	12	55	6	189	18
Church U.D.C. ...	19	0	14	0	33	0

Table 8—continued.

District.	Milk.		Other Articles.		Total.	
	Samp- les.	Adult.	Samp- les.	Adult.	Samp- les.	Adult.
Clayton-le-Moors U.D.C.	23	0	15	0	38	0
Clitheroe Borough ...	38	0	22	4	60	4
Clitheroe R.D.C. ...	43	2	8	2	51	4
Crompton U.D.C. ...	54	1	29	1	83	2
Dalton-in-Furness U.D.C. ...	32	3	22	0	54	3
Denton U.D.C. ...	77	3	57	5	134	8
Droylsden U.D.C. ...	90	3	47	7	137	10
Failsworth U.D.C. ...	64	1	36	2	100	3
Farnworth Borough ...	88	0	61	3	149	3
Fleetwood Borough ...	78	1	62	2	140	3
Formby U.D.C. ...	32	2	18	0	50	2
Fulwood U.D.C. ...	32	2	38	3	70	5
Fylde R.D.C. ...	61	3	29	0	90	3
Garstang R.D.C. ...	87	5	19	0	106	5
Golborne U.D.C. ...	52	0	14	0	66	0
Grange U.D.C. ...	18	0	23	2	41	2
Great Harwood U.D.C.	39	4	17	0	56	4
Haslingdon Borough ...	59	1	16	1	75	2
Haydock U.D.C. ...	53	1	21	3	74	4
Heywood Borough ...	92	3	40	1	132	4
Hindley U.D.C. ...	59	2	22	0	81	2
Horwich U.D.C. ...	24	1	28	0	52	1
Ince-in-Makerfield U.D.C. ...	72	0	26	2	98	2
Irlam U.D.C. ...	44	0	32	1	76	1
Kearsley U.D.C. ...	34	0	16	2	50	2
Kirkby U.D.C. ...	93	1	75	9	168	10
Kirkham U.D.C. ...	24	0	17	1	41	1

Table 8—continued.

District.	Milk.		Other Articles.		Total.	
	Samp-les.	Adult.	Samp-les.	Adult.	Samp-les.	Adult.
Lancaster R.D.C. ...	77	2	54	3	131	5
Lees U.D.C. ...	19	0	8	1	27	1
Leyland U.D.C. ...	44	6	48	5	92	11
Litherland U.D.C. ...	100	3	31	2	131	5
Little Lever U.D.C. ...	20	0	7	0	27	0
Littleborough U.D.C. ...	40	0	15	2	55	2
Longridge U.D.C. ...	15	1	8	4	23	5
Lunesdale R.D.C. ...	37	3	16	0	53	3
Lytham St. Annes Borough ...	87	1	69	2	156	3
Milnrow U.D.C. ...	38	0	11	0	49	0
Mossley Borough ...	32	0	19	0	51	0
Nelson Borough ...	103	0	63	2	166	2
Ormskirk U.D.C. ...	52	1	53	3	105	4
Orrell U.D.C. ...	34	2	22	2	56	4
Oswaldtwistle U.D.C. ...	89	1	14	0	103	1
Padiham U.D.C. ...	28	1	22	2	50	3
Poulton-le-Fylde U.D.C. ...	32	1	14	0	46	1
Preesall U.D.C. ...	15	0	14	1	29	1
Prescot U.D.C. ...	35	0	31	0	66	0
Preston R.D.C. ...	134	6	78	1	212	7
Prestwich Borough ...	130	1	70	5	200	6
Radcliffe Borough ...	81	4	68	2	149	6
Rainford U.D.C. ...	8	0	12	0	20	0
Ramsbottom U.D.C. ...	38	1	39	2	77	3
Rawtenstall Borough ...	93	3	36	3	129	6
Rishton U.D.C. ...	22	0	12	1	34	1
Royton U.D.C. ...	54	1	35	0	89	1
Skelmersdale U.D.C. ...	10	0	14	0	24	0

Table 8—continued.

District.	Milk.		Other Articles.		Total.	
	Samp- les.	Adult.	Samp- les.	Adult.	Samp- les.	Adult.
Standish-with-Langtree U.D.C.	19	0	9	1	28	1
Thornton Cleveleys U.D.C.	55	0	26	1	81	1
Tottington U.D.C. ...	29	2	10	0	39	2
Trawden U.D.C. ...	12	0	3	0	15	0
Turton U.D.C.	40	2	25	0	65	2
Tyldesley U.D.C. ...	42	0	48	1	90	1
Ulverston R.D.C. ...	140	5	23	1	163	6
Ulverston U.D.C. ...	32	2	30	2	62	4
Up Holland U.D.C. ...	16	0	21	2	37	2
Urmston U.D.C. ...	129	0	71	4	200	4
Walton-le-Dale U.D.C.	85	5	49	3	134	8
Wardle U.D.C.	18	0	9	0	27	0
Warrington R.D.C. ...	138	7	29	2	167	9
West Lancashire R.D.C.	102	4	132	11	234	15
Westhoughton U.D.C. ...	55	2	22	0	77	2
Whiston R.D.C. ...	120	2	45	2	165	4
Whitefield U.D.C. ...	34	0	31	0	65	0
Whitworth U.D.C. ...	26	0	12	0	38	0
Wigan R.D.C.	51	0	15	0	66	0
Withnell U.D.C. ...	13	1	6	0	19	1
Worsley U.D.C. ...	90	11	75	8	165	19
Miscellaneous	509	75	1	0	510	75
Total County Districts	5385	231	2840	174	8225	405
Eleven Autonomous Food and Drugs Authorities	1226	39	884	80	2110	119
Total—All Sources ...	6611	270	3724	254	10335	524

Adulteration of Milk in the County.

The number of milks submitted under the Food and Drugs Act during the year was 5,385, and of these 231 were reported against ; the amount of adulteration was, therefore, 4·3 per cent. This figure, as will be seen from table 9, is lower than the average for the last 10 years and although higher than for the years 1956 and 1957 it is still the third lowest shown in the table.

Table 9.

Percentage of Adulteration of Milk Samples, 1949-1958.

Year.			No. of Samples.	No. of Adulterated Samples.	Percentage of Adulteration.
1949	...	...	5,157	301	5·8
1950	...	...	5,324	285	5·3
1951	...	...	5,811	291	5·0
1952	...	...	5,804	298	5·1
1953	...	...	5,872	281	4·8
1954	...	...	5,115	287	5·6
1955	...	...	5,637	273	4·8
1956	...	...	5,497	203	3·7
1957	...	...	5,411	190	3·5
1958	...	...	5,385	231	4·3
Totals ...			55,013	2,640	4·8

The Adulteration of Milk in the County for each month of the year.

In table 10 will be found the figures for the number of milk samples submitted by County Sampling Officers during each month of the year together with the number adulterated and the percentage adulteration. In general the percentage adulteration usually increases during late winter and decreases in the autumn. The increasing adulteration of milk noted during the winter and first half of the year may be due to two factors : (a) the poorer quality of milk towards the end of the winter enables cases of slight adulteration to be detected more readily and, (b) the scarcity of milk in the winter may, in some instances, be an incentive to adulteration. The exceptionally high adulteration figure for the month of July, includes 28 adulterated samples obtained from only three suppliers.

Table 10.

Milk.—Monthly Adulteration, 1958.

Month.		Number of Samples.	Number Adulterated.	Percentage of Adulteration.
January	...	484	19	3·9
February	...	390	24	6·1
March	... ..	477	24	5·0
April	... ..	461	22	4·8
May	... ..	451	20	4·4
June	... ..	355	18	5·0
July	... ..	612	62	10·1
August	... ..	424	4	0·9
September	...	356	9	2·5
October	... ..	524	3	0·6
November	...	466	13	2·8
December	...	385	13	3·4
Total	...	5,385	231	4·3

In the following table will be found particulars of the various types of adulteration and the number of samples under each heading :—

Table 11.

					<i>Per cent.</i>
Milks deficient in fat only	...	...	...	122	<i>or</i> 2·27
Milks containing added water only	...	...	...	95	<i>or</i> 1·77
Milks deficient in fat and containing added water	...	...	...	8	<i>or</i> 0·15
Milks containing foreign matter, etc.	...	...	...	6	<i>or</i> 0·11
Milks containing preservatives	...	...	...	Nil	<i>or</i> Nil
Milks containing colouring matter	...	...	...	Nil	<i>or</i> Nil
				<u>231</u>	<u><i>or</i> 4·30</u>
Milks containing more than 3 per cent. added water	...	...	...	38	<i>or</i> 0·70
Milks 10 per cent. or more deficient in fat	...	...	...	43	<i>or</i> 0·71

Alternatively the milk adulteration can be expressed in terms of the adulteration of the various grades of milk as shown in the following table.

Table 12.

Grade of Milk.	Number of Samples.	Number Adulterated.	Percentage of Adulteration.
Pasteurised	1,274	15	1.18
Tuberculin Tested (Pasteurised)	954	15	1.57
Sterilised... ..	497	5	1.00
Tuberculin Tested	233	7	3.00
†Raw	2,427	189	7.78
*Channel Islands (all grades)	204	7	3.43

† Will include raw designated milks not submitted as such.

* The figures for Channel Islands Milks are included here for completeness but for all other purposes in this report they are considered separately as they come under Regulations of their own, see page 40.

It will be noted from table 12 that all the heat treated milks show a lower rate of adulteration than the types of raw milk. This is primarily because heat treated milks are normally bulked before processing and irregularities in individual churns or consignments may thereby be obscured. As against this the high adulteration rate for raw undesignated milks is weighted by the selective sampling of a number of milks, taken on delivery to processing dairies, which were the subject of complaint by the dairy managements.

“ Serious ” and “ Less Serious ” Adulteration.

At first sight it may seem unjustifiable to speak of “ serious ” and “ less serious ” aspects of adulteration, for any adulteration of such an indispensable article of the diet as milk, must be regarded as serious. The figures, therefore, given in table 11 for adulteration include all samples which were found to be deficient in fat or which contained added water, irrespective of whether the deficiency or the added water was small, or great enough to justify a prosecution.

It has been the practice for some years now in these Reports, however, to attempt to distinguish between “serious” and “less serious” adulteration and since a useful purpose appears to be served by this classification it is continued this year. The general principle is to include under the term “serious,” samples so grossly adulterated as to justify the institution of legal proceedings on analytical grounds and to class the rest, still adulterated, but not to so great an extent, under the term “less serious.”

A study of table 11 reveals that 1.41 per cent. or approximately one-third of the total milk adulteration may be considered “serious.” This figure includes 38 samples which contained added water and 43 samples which were deficient in fat. A number of these seriously adulterated samples were taken informally and could not, therefore, be the subject of prosecutions. In several other instances corresponding appeal-to-cow samples of poor quality were submitted by the Sampling Officers. Prosecutions were recommended, however, in respect of 13 samples.

It will be noted that in addition to samples deficient in fat or containing water, there are six samples in table 11 which contained foreign matter, etc. Of these, three contained fragments of broken glass, one contained a small amount of mineral matter of the nature of cement and one contained a small flower head. The vendors of these five samples were all cautioned. The remaining sample contained visible dirt of the nature of dung to the extent of 32 parts by volume of moist dirt in 100,000 parts by volume of the milk and a prosecution under Section 2 of the Food and Drugs Act, 1955, was instituted against the vendors who were fined £15 and £8 16s. 2d. costs.

In table 13 are given details in regard to the adulterated milk samples, submitted by County Sampling Officers, which were the subject of legal proceedings, together with the results of the prosecutions.

Table 13.

Milk Prosecutions, 1958.

Number of Sample.	Nature of Adulteration or Irregularity.	Observations.
S.1150	Deficient 7.3 per cent. solids-not-fat ; freezing point indicated 7.1 per cent. extraneous water 	} Same vendor. Section 2 Food and Drugs Act, 1955. Fined £10 and £7 costs in respect of S.1150.
S.1151	Freezing point indicated 0.8 per cent. extraneous water	
C.9870	Deficient 35 per cent. fat and 23.6 per cent. solids-not-fat ; freezing point indicated 25.7 per cent. extraneous water	} Same vendor. Section 2 Food and Drugs Act, 1955. Fined £10 and £8 15s. costs.
C.9871	Deficient 24.1 per cent. solids-not-fat ; freezing point indicated 25.8 per cent. extraneous water	
C.148	Deficient 10.3 per cent. solids-not-fat ; freezing point indicated 8.7 per cent. extraneous water	} Same vendor. Section 2 Food and Drugs Act, 1955. Fined £10 and £14 costs.
C.149	Deficient 8.9 per cent. solids-not-fat ; freezing point indicated 7.7 per cent. extraneous water	
C.151	Deficient 6.7 per cent. solids-not-fat ; freezing point indicated 8.3 per cent. extraneous water	
C.152	Deficient 3.4 per cent. solids-not-fat ; freezing point indicated 3.4 per cent. extraneous water.	
C.153	Deficient 18.4 per cent. solids-not-fat ; freezing point indicated 15.3 per cent. extraneous water	
C.154	Deficient 9.1 per cent. solids-not-fat ; freezing point indicated 7.8 per cent. extraneous water	} Section 32 Food and Drugs Act, 1955. Fined £5 and £4 18s. costs.
N.9734	Deficient 5.4 per cent. solids-not-fat ; freezing point indicated 7.1 per cent. extraneous water	
N. 37	Deficient 28.3 per cent. fat 	Section 2 Food and Drugs Act, 1955. Fined £5 and £4 18s. costs.
C.860	Deficient 46 per cent. fat 	Section 2 Food and Drugs Act, 1955. Fined £5 and £4 18s. costs.
E.2538	Contained visible dirt of the nature of dung 32 parts by volume of moist dirt in 100,000 parts by volume of the milk	Section 2 Food and Drugs Act, 1955. Fined £15 and £8 16s. 2d. costs.

Adulteration of Milk : the County compared with Other Areas.

In the following table the percentage of milk adulteration for the year 1958 is given for a number of districts in England whose figures were available at the time of writing. The corresponding figure for the County of Lancaster was 4·3 per cent., as against 3·5 per cent. in the year 1957 and 3·7 per cent. in the year 1956. The percentage of milk adulteration in the County for the year under review is very slightly higher than the average (4·2 per cent.) for the areas included in the table. The rate of adulteration in these districts varied from 10·1 to 0·9 per cent.

Table 14.

Milk Adulteration, 1958. Various Districts.

Area.	Number of Samples.	Per cent. of Adult.	Area.	Number of Samples.	Per cent. of Adult.
Durham, County ...	1,270	1·8	Bristol	976	5·6
Kent, County ...	1,238	2·5	Leeds	3,103	1·8
Somersetshire, County ...	1,183	5·6	Leicester	1,510	0·9
Staffordshire, County ...	4,416	1·9	Liverpool	3,205	4·7
Worcestershire, County ...	4,019	8·0	Manchester ...	1,411	5·5
Birmingham ...	2,839	10·1	Salford	804	1·9

Adulteration of Milk : England and Wales.

In table 15 there are set out the percentages of milk adulteration for the whole of England and Wales for a long period, 34 years, omitting the years of both wars, which are, unfortunately, not available. It will be seen that the figure for milk adulteration in the County, *i.e.*, 4·3 per cent. is lower than the average for the whole of England and Wales for the 34 years mentioned. In fact, in none of the years included in the table was the milk adulteration for England and Wales lower than that of the County for the year under review. Furthermore, this is the eleventh time since the year 1940 that the figure for milk adulteration has fallen below the average for England and Wales for the years included in the table, the first time being in the year 1948 when the milk adulteration was 6·6 per cent.

Table 15.
Percentage of Milk Adulteration for England and Wales,
1900-1938.

Year.		Number Examined.	Number Adulterated.	Percentage of Adulteration.
*1900-1913	...	569,916	62,318	10.9
1919	... ..	57,361	6,374	11.1
1920	... ..	62,463	5,797	9.3
1921	... ..	61,439	5,290	8.6
1922	... ..	60,274	4,624	7.7
1923	... ..	59,925	4,684	7.8
1924	... ..	62,133	4,773	7.7
1925	... ..	61,909	5,163	8.3
1926	... ..	62,507	4,625	7.4
1927	... ..	63,687	4,398	6.9
1928	... ..	67,350	5,542	8.2
1929	... ..	68,115	5,293	7.8
1930	... ..	69,311	4,581	6.6
1931	... ..	70,201	4,507	6.4
1932	... ..	72,940	5,307	7.3
1933	... ..	74,545	5,760	7.7
1934	... ..	76,930	5,506	7.2
1935	... ..	78,674	5,798	7.4
1936	... ..	80,082	5,706	7.1
1937	... ..	82,357	6,107	7.4
1938	... ..	80,025	6,141	7.7
Totals	...	1,942,144	168,294	8.7

* Figures for 1914-1918 and 1939-1958 inclusive, not available.

General.

MILK.

As in previous years the greater proportion of the samples submitted during the year consisted of milk ; the number of samples of milk was 5,385 out of a total number of samples submitted of 8,225.

The first impression created may be that the number of samples of milk seems unduly high as compared with the number of other samples. Taking into account, however, the fact that every day's production

represents a separate consignment probably delivered in bottles or churns any one of which might be adulterated and the others genuine, also the perishable nature of the commodity and the importance attached to milk as a food particularly for children, mothers and invalids, it is essential that adequate steps should be taken to ensure an unadulterated supply.

Such circumstances as these have led to the conclusion that, for the detection of adulteration and in order to safeguard the quality of daily supplies, it is advisable to take a relatively large proportion of samples of milk. In a memorandum issued by the Clerk of the Lancashire County Council, it is suggested that out of each 100 samples of food and drugs taken, about 60 should consist of milk.

The Standards of Quality for Milk.

In some countries there is a definite standard of quality required for liquid milk sold to the public ; it is then illegal to sell milk which is below that standard. In this country the law is less stringent. The present Food and Drugs Act contains no standards for milk. The position remains very much as it was before this Act came into operation, in that the one requirement laid down by law is that milk must be sold to each purchaser in the condition in which it came from the cow. If it attains a certain limit or exceeds it, it is to be regarded as above suspicion, and if it is below that limit it only becomes suspect, and it falls to the lot of the person who sold it to establish, if he can, before the Court that nothing has been added to it, or no ingredient abstracted from it.

In furtherance of the principle outlined in the preceding paragraph, presumptive limits for the composition of milk were established after exhaustive enquiries by a Government Committee appointed by the Board of Agriculture in 1900.

The outcome of the deliberations of this Committee was the production of the Sale of Milk Regulations, 1901, which were modified as regards skimmed milk in 1912. These Regulations were reproduced, in effect unaltered, in October 1939, in the Sale of Milk Regulations, 1939, made by the then Ministry of Agriculture and Fisheries. They are as follows :—

(1) Where a sample of milk (not being milk sold as separated, or condensed, milk) contains less than 3 per cent. of milk-fat, it shall be presumed for the purposes of the Food and Drugs Act, 1938, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-fat, or the addition thereto of water.

(2) Where a sample of milk (not being milk sold as separated, or condensed, milk) contains less than 8·5 per cent of milk-solids other than milk-fat, it shall be presumed for the purposes of the Food and Drugs Act, 1938, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-solids other than milk-fat, or the addition thereto of water.

(3) Where a sample of separated milk (not being condensed milk) contains less than 8·7 per cent. of milk-solids other than milk-fat, it shall be presumed for the purposes of the Food and Drugs Act, 1938, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-solids other than milk-fat, or the addition thereto of water.

The above presumptive standards with regard to the composition of milk have, therefore, been operative for well over 50 years. Recently, however, they have been under a considerable amount of criticism implying that they do not accord with present-day conditions. Another Government Committee was, therefore, appointed during the year under review to consider the composition of milk from the standpoint of human nutrition and animal husbandry and to recommend any changes in legislation considered desirable.

Reverting to the present-day Regulations, it will be seen that no definite standard for milk is set up by them. They say, in effect, that a suspicion that adulteration may have been practised is to be entertained if either the fat falls below 3·0 per cent. or the non-fatty solids below 8·5 per cent. The very fact that failure to attain the limits only raises a presumption that milk is adulterated, means that it is admitted that a sample of milk may be genuine, that is, not tampered with in any way, although it does not reach the figure for fat or solids-not-fat or both.

That is one side of the picture, a milk may be genuine so far as the law is concerned, and yet contain less than 3·0 per cent. of fat and 8·5 per cent. of solids-not-fat. Many milks, in fact most milks, however, have a composition well above 3·0 per cent. of fat. For instance, the average fat content of all the milks analysed in the County during the year was 3·68 per cent. Similarly the solids-not-fat are usually above 8·5 per cent., the average for the year being 8·63 per cent. The solids-not-fat may be considerably higher than the average figure just mentioned and an appreciable amount of water could then be added without bringing the solids-not-fat below the presumptive limit. For example, if a milk contained 9·3 per cent. of solids-not-fat it would be possible to add about 8·6 per cent. of water without the milk falling below the limit of the Sale of Milk Regulations. This possibility has been anticipated and provided for by Section 32 of the Food and Drugs Act, 1955, which re-enacts Section 24 of the 1938 Act, under which it is an offence to add water to milk (irrespective of the composition of the resulting mixture). The Hortvet Freezing Point Test enables the analyst to detect the presence and determine the amount of extraneous water in milk even in cases where the solids-not-fat have not been reduced below 8·5 per cent.

Channel Islands Milk and South Devon Milk.

In addition to the above standards of quality, which are applicable to all milk, a special standard for milk-fat content of not less than four

per cent. was originally prescribed in the Milk (Control and Maximum Prices) (Great Britain) Order, 1947, for "Channel Islands Milk" and for "South Devon Milk." The enforcement of this standard was the responsibility of the Ministry of Agriculture, Fisheries and Food, but during the year 1956, the Milk and Dairies (Channel Islands and South Devon Milk) Regulations came into operation and made food and drugs authorities responsible for enforcing the standard. "Channel Islands Milk" and "South Devon Milk" are defined by the Milk (Great Britain) Order, 1958, as being milk (a) which is produced from cows of the Channel Islands or South Devon Breeds and (b) which is labelled "Channel Islands Milk," "Jersey Milk," "Guernsey Milk" or "South Devon Milk" when sold in a container. This last Order also prescribes maximum prices for Channel Islands and South Devon Milk. The enforcement of the maximum price is still the responsibility of the Ministry of Agriculture, Fisheries and Food and Food and Drugs authorities are, therefore, requested to report to the Ministry details of any samples of Channel Islands and South Devon Milk sold at the higher price prescribed which are found to contain less than four per cent. of fat. This is, of course, in addition to any enforcement action in regard to fat deficiency which the Food and Drugs authority may, itself, decide to take. During the year, 1958, 238 samples of Channel Islands Milk were examined (204 were submitted by County Sampling Officers and 34 by Autonomous Authorities). They were found upon analysis to have an average butter-fat content of 4.76 per cent., and an average solids-not-fat content of 8.97 per cent. Of the 238 samples examined 231 were satisfactory. Of the seven unsatisfactory samples (all County) No's C.9346, C.9951, N.76 and N.191 were found to have butter-fat contents of only 3.60, 3.95, 3.80 and 3.75 per cent. respectively. Follow-up samples were taken in each case and found to be genuine. Samples No's S.1909 and C.198 had butter-fat contents of 3.85 and 3.50 per cent. respectively. The vendors of these two samples were both cautioned but, owing to their ceasing to sell Channel Islands Milk, follow up samples could not be taken. The remaining sample, No. N.9756 had a butter-fat content of only 3.50 per cent.; legal proceedings were instituted against the supplier but at the court hearing the summons was dismissed although the analytical findings were not questioned.

The Average Composition of Milk during the Year.

Genuine milk has not always the same composition. There are natural variations in the amounts of both fat and solids-not-fat in milk as drawn from the cow. It, therefore, becomes a matter not only of interest but also of importance and significance, to know the average values for these two constituents. This information is given for the year 1958 in table 16, where it will be seen that the average figure for fat is 3.68 per cent., for solids-not-fat 8.63 per cent. and for total solids 12.31 per cent.

It should be pointed out that the average compositions and frequencies included in this section of the Report are calculated from the results of all the samples of milk (other than Channel Islands milk) received ; that is to say, there are included all adulterated samples and further, all appeal-to-cow samples, whether they were above or below the limits for fat and solids-not-fat laid down by the Sale of Milk Regulations. The figures for average composition calculated on this basis will, therefore, tend to be somewhat lower than those for genuine milk sold in the County.

Table 16.
Average Composition of Milk, 1958.

Month.	Number of Samples.*	Fat per cent.	Solids-not-fat per cent.	Total Solids per cent.
January ...	484	3.63	8.61	12.24
February ...	1,356 { 395	3.60 { 3.58	8.62 { 8.63	12.22 { 12.21
March ...	477	3.59	8.63	12.22
April ...	489	3.54	8.59	12.13
May ...	1,299 { 450	3.57 { 3.61	8.64 { 8.67	12.21 { 12.28
June ...	360	3.57	8.67	12.24
July ...	618	3.65	8.61	12.26
August ...	1,398 { 424	3.68 { 3.68	8.63 { 8.63	12.31 { 12.31
September ...	356	3.74	8.65	12.39
October ...	524	3.92	8.68	12.60
November ...	1,386 { 477	3.86 { 3.87	8.61 { 8.60	12.47 { 12.47
December ...	385	3.78	8.53	12.31
Whole year ...	5,439	3.68	8.63	12.31

* Includes Appeal-to-Cow samples but does not include Channel Islands milk and one sample of Milk examined for foreign matter only.

The Average Composition of Milk for each Month of the Year.

Table 16 also includes the figures for the averages of fat and solids-not-fat for each month of the year. As regards fat it will be seen that April has the lowest figure, 3.54 per cent., and October the highest, 3.92 per cent. In respect of solids-not-fat, the lowest figure was obtained in December, 8.53 per cent., the highest in October, the figure then being 8.68 per cent. These variations, particularly in respect of fat content, have been the general experience for many years, the fat content usually being at its lowest in the spring and at its highest in the autumn. Solids-not-fat tend to be lower in the winter.

The Average Composition of Morning and Evening Milk during the Year.

Usually, when samples are submitted, the information is given whether they are morning or evening milks. It has, therefore, been possible to classify them so as to show the average composition of morning and evening milks separately.

When cows are milked at the usual intervals the evening milk, due to the shorter interval, is richer in fat than the morning milk, while there is little if any difference as a rule in solids-not-fat. This is illustrated in table 17 below, where the average fat for morning milk is 3.55 per cent., and the evening fat 4.01 per cent. ; the fat in the evening milk being greater by 0.46 per cent., while the averages for solids-not-fat are very similar for the morning and evening milk.

Table 17.
The Average Composition of Morning and Evening Milk
during the Year.

	Number of Samples.*	Fat per cent.	Solids-not-fat per cent.	Total solids per cent.
Morning Milk	1,255	3.55	8.60	12.15
Evening Milk	792	4.01	8.68	12.69
Mixed Milk ...	151	3.58	8.56	12.14
Unknown ...	3,241	3.66	8.62	12.28
Total ...	5,439	3.68	8.63	12.31

* Includes Appeal-to-Cow samples but does not include Channel Islands milk and one sample of Milk examined for foreign matter only.

The Average Composition of Milk : compared with past years.

In table 18 the average composition of all the milks examined is set out for the period 1910-1958. It will be seen that the average figure for fat does not vary greatly from year to year. In respect of solids-not-fat there is very little difference in the averages for the years 1910-1940. Since 1940, however, it will be noted there is an appreciable decrease in solids-not-fat, the lowest figure of 8.55 per cent. being obtained in the year 1943. The average for solids-not-fat for the year under review was 8.63 per cent. In addition to other possible causes for this decrease it should be remembered that seven of the 18 years during which the average solids-not-fat have been lower than formerly were years which showed a high rate of adulteration. Since the year 1943 there has been, in general, a tendency for solids-not-fat to show an upward trend but they are still appreciably below the pre-war figures.

Table 18.
Average Composition of Milk, 1910-1958.

Year.	Number of Samples.	Fat per cent.	Solids-not-fat per cent.	Total Solids per cent.
1910 to 1930 ...	56,028	3.67	8.90	12.57
1931	3,090	3.84	8.81	12.65
1932	3,205	3.77	8.85	12.62
1933	3,060	3.76	8.82	12.58
1934	3,310	3.74	8.81	12.55
1935	3,422	3.75	8.84	12.59
1936	3,098	3.73	8.88	12.61
1937	3,278	3.74	8.84	12.58
1938	3,398	3.70	8.78	12.48
1939	3,128	3.67	8.78	12.45
1940	2,144	3.70	8.79	12.49
1941	1,866	3.70	8.64	12.34
1942	1,516	3.75	8.66	12.41
1943	1,489	3.70	8.55	12.25
1944	1,197	3.69	8.57	12.26
1945	1,096	3.72	8.57	12.29
1946	2,776	3.75	8.58	12.33
1947	4,625	3.75	8.63	12.38
1948	4,523	3.67	8.64	12.31
1949	5,210	3.66	8.65	12.31
1950	5,362	3.68	8.67	12.35
1951	5,839	3.67	8.65	12.32
1952	5,844	3.67	8.68	12.35
1953	5,922	3.68	8.68	12.36
1954	5,182	3.71	8.65	12.36
1955	5,686	3.68	8.66	12.34
1956	5,524	3.71	8.59	12.30
1957	5,485	3.68	8.63	12.31
1958	5,439	3.68	8.63	12.31
1910 to 1958 ...	161,742*	3.71	8.82	12.53

* Does not include Channel Islands milk and four samples of Milk examined for

Composition of Milk : the County compared with Other Areas.

In table 19 below, figures are given for the composition of milk during the year 1957 in the areas of 12 other Food and Drugs Authorities. The corresponding figures for the County of Lancaster, based upon 5,439 samples of milk, are fat 3·68 per cent., solids-not-fat 8·63 per cent., and total solids 12·31 per cent. It will be noted that the Lancashire figures for both fat and solids-not-fat are slightly below the average results for the other areas listed, *viz.*, fat 3·71 per cent. and solids-not-fat 8·72 per cent.

Table 19.

Composition of Milk, 1958. Various Districts.

Area.	Number of Samples.	Fat per cent.	Solids-not-fat per cent.	Total Solids per cent.
Durham, County ...	1,270	3·74	8·66	12·40
Kent, County	1,248	3·68	8·78	12·46
Somersetshire, County ...	1,255	3·66	8·75	12·41
Staffordshire, County ...	4,496	3·71	8·63	12·34
Worcestershire, County	4,044	3·76	8·70	12·46
Birmingham	2,849	3·71	8·74	12·45
Leeds	3,106	3·73	8·76	12·49
Leicester	1,510	3·74	8·77	12·51
Liverpool	3,205	3·74	8·69	12·43
Manchester	1,411	3·65	8·75	12·40
Portsmouth	565	3·79	8·66	12·45
Salford	806	3·69	8·82	12·51

The Composition of Milk : Frequencies.

The 5,439 samples of milk examined for chemical composition during the year have been arranged in table 20 to show the number of samples having the same percentage of fat, or, in other words, the frequency with which each percentage of fat, differing by 0·1 per cent., occurred. The table has been shortened by placing in separate groups all samples containing less than 2·5 per cent. and above 3·9 per cent. This information is given for the whole year and for each month of the year.

This table gives different information than do figures for averages. It shows that, as in previous years, there are comparatively few samples below 3·0 per cent. It also shows how the figures from which the averages are calculated are distributed, information which is not obtainable from the figures for averages alone.

In this table, and the following one, table 21, all samples of milk are included, whether adulterated or not, and also all appeal-to-cow samples.

Table 20.
Composition of Milk : Frequencies.
FAT.

Per cent.	NUMBER OF SAMPLES.												
	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Under 2·5	0	5	0	4	1	3	6	0	0	0	1	0	20
2·5	2	0	0	3	1	1	1	0	0	0	0	0	8
2·6	2	2	0	4	2	1	4	0	0	0	1	1	17
2·7	3	5	3	4	3	1	6	1	1	0	0	0	27
2·8	2	5	4	6	3	5	3	1	1	0	2	2	34
2·9	3	4	6	6	8	3	12	1	1	0	3	0	47
3·0	16	17	15	16	10	17	15	8	5	2	0	4	125
3·1	16	12	15	18	12	10	27	4	10	3	9	5	141
3·2	7	15	22	14	21	17	22	17	14	8	8	10	175
3·3	23	29	28	29	44	31	32	21	14	6	8	11	276
3·4	46	50	62	68	65	60	76	38	19	17	11	12	524
3·5	109	75	118	136	80	68	123	74	34	17	20	27	881
3·6	113	52	66	68	53	48	98	89	53	19	35	45	739
3·7	35	30	30	27	31	30	47	55	72	61	83	80	581
3·8	25	22	24	20	23	17	39	32	36	114	91	93	536
3·9	12	12	21	14	14	8	19	17	18	111	57	23	326
4·0 and Over	70	60	63	52	79	40	88	66	78	166	148	72	982
Totals ..	484	395	477	489	450	360	618	424	356	524	477	385	5439

Table 21 gives the frequencies for solids-not-fat. It has already been stated that the average figure for solids-not-fat for the year was 8·63 per cent., and the bulk of the individual figures for solids-not-fat are arranged closely around the average. Tables 20 and 21 bring out the further point that a much higher proportion of milks fall below the presumptive limit of 8·5 per cent. for solids-not-fat than fall below the presumptive limit of 3·0 per cent. for milk-fat.

Table 21.
Composition of Milk : Frequencies.
 SOLIDS-NOT-FAT.

Per cent.	NUMBER OF SAMPLES.												
	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Under 7·8	0	0	2	3	0	4	8	0	0	0	0	1	18
7·8	0	0	2	3	0	0	2	0	0	1	0	0	8
7·9	0	0	1	0	0	0	7	0	0	1	0	0	9
8·0	0	1	1	0	1	0	5	3	1	1	0	2	15
8·1	2	3	1	3	0	0	7	0	0	1	1	4	22
8·2	3	6	3	2	0	0	6	3	1	1	8	6	39
8·3	19	14	7	16	2	5	27	9	3	2	17	22	143
8·4	35	24	28	41	28	18	42	26	27	15	49	81	414
8·5	120	89	110	161	74	41	120	107	62	79	125	127	1215
8·6	175	134	167	146	139	104	167	126	117	145	155	91	1666
8·7	82	59	76	52	117	97	126	88	97	160	78	33	1065
8·8	30	31	40	38	56	53	44	41	29	81	28	13	484
8·9	8	23	23	14	12	21	25	11	11	28	11	3	190
9·0 and Over	10	11	16	10	21	17	32	10	8	9	5	2	151
Totals ..	484	395	477	489	450	360	618	424	356	524	477	385	5439

Samples of Milk taken for Comparison.

Part II of the Seventh Schedule of the Food and Drugs Act, 1955, contains certain provisions relating to the procuring of comparison samples of milk. Briefly, when a sample of milk is obtained from a vendor he must, if so requested, give to the Sampling Officer the name and address of the person from whom he, in turn, received the milk. The vendor may also, within 60 hours of the sample being taken, serve on the Food and Drugs Authority a notice stating the name and address of the person from whom he received the milk and the time and place of delivery to himself of milk from a corresponding milking, and requesting the Authority to procure, as soon as practicable, a sample of milk from a corresponding milking in course of transit or delivery to himself. The vendor shall have no right to request such a sample if the original sample procured from him was a mixture of milk produced on more than one dairy farm. In turn, the dairyman from whom such a sample of milk is procured in course of transit or delivery, may, within 60 hours after the sample was procured, serve on the Authority concerned a notice requesting

that immediate steps be taken to procure a sample of milk from a corresponding milking of the cows. The person procuring this last sample shall be empowered to take such steps at the dairy as may be necessary to satisfy him that the sample is a fair sample of the milk of the cows when properly and fully milked.

It is the practice in the County for the Sampling Officers to take, in appropriate cases, follow-up and appeal-to-cow samples without a formal request being made by the vendor. This involves a considerable amount of work both for the Sampling Officers and the Analyst. Sometimes both types of samples are obtained and as many as six and occasionally even a greater number of samples may be taken in connection with one unsatisfactory sample. For example, during the year under review 28 appeal-to-cow samples were taken in connection with one original sample of milk (see table 22). It is thought desirable to undertake this large amount of work to ensure that everything possible is done to establish beyond all reasonable doubt that a sample is adulterated and not of naturally poor quality and, if adulterated, to obtain information indicating where the adulteration occurred before deciding whether legal proceedings should be instituted.

Appeal-to-Cow Samples.

Appeal-to-cow samples, or, as they are sometimes called, "byre" samples, if the method of taking them is properly carried out in every detail, may be regarded in the light of a final appeal. The milking must be carefully supervised, it must be established that the same cows are milked, that it is the corresponding milking and the dairy equipment must be inspected to see that it is clean and dry. The results of analysis of samples procured in this way must be accepted as those pertaining to genuine milk. Appeal-to-cow samples serve at least two purposes. In the first place, they show, in cases where an unsatisfactory sample has been sold, the quality of the unadulterated milk given by the cows, and, secondly, extend our knowledge of the quality of the milk of different herds and of the natural variations which may occur in the composition of genuine milk.

It was with the former object in view that the practice of taking appeal-to-cow samples was instituted, *viz.*, to ascertain the composition of the milk given by the cows. It is now generally admitted that the composition of the milk from a herd of cows may occasionally fall below the limits laid down in the Sale of Milk Regulations, particularly at the morning milking. When such a milk is examined the question arises whether it is an unadulterated milk of poor quality, or a milk of normal composition which has been tampered with; the appeal-to-cow sample is intended to help to solve this problem.

In table 22, there is given a list of appeal-to-cow samples, submitted by County Sampling Officers during the year 1958, and also the results of analysis. Fifty-five such samples are included, representing seven herds, the number of cows in the herds varying from nine to 106.

In addition five appeal-to-cow samples were examined for autonomous authorities.

Table 22.
Analysis of Appeal-to-Cow Samples of Milk.

Number	Number of Cows Milked.	Approximate yield, gallons.	Morning or Evening.	Fat per cent.	Solids-not-fat per cent.	Freezing Point (Hortvet) °C.	Taken for comparison with numbers.	Observations.
481	27	38½	M	2.70	8.92	—0.548	N.8648 and N.8649	Poor in fat.
482				2.70	8.56	—0.550		Poor in fat.
483				2.35	8.35	—0.542		Poor in fat and low in solids-not-fat.
484				2.30	8.64	—0.545		Poor in fat.
485				2.25	8.69	—0.543		Poor in fat.
S.1387	5	7	M	3.30	8.48	—0.541	S.1381	Slightly low in solids-not-fat.
S.1388	5	8½		3.10	8.30	—0.542		Low in solids-not-fat.
S.1389	5	8		4.00	8.46	—0.550		Slightly low in solids-not-fat.
S.1390	4	7		2.70	8.68	—0.539		Poor in fat.
S.1391	3	7		2.45	8.75	—0.541		Poor in fat.
S.1392	4	7		2.95	8.57	—0.541		Poor in fat.
S.1393	3	7		2.35	8.47	—0.544		Poor in fat and slightly low in solids-not-fat.
S.1394	3	6		2.65	8.81	—0.542		Poor in fat.
S.1395	4	6		3.10	8.58	—0.543		
S.1396	5	8		2.95	8.59	—0.530		Poor in fat.
S.1397	5	9		2.55	8.17	—0.532		Poor in fat and low in solids-not-fat.
S.1398	4	8		3.10	8.44	—0.540		Slightly low in solids-not-fat.
S.1399	3	3½		2.00	8.44	—0.535		Poor in fat and slightly low in solids-not-fat.
S.1400	4	8		2.35	8.49	—0.539		Poor in fat and slightly low in solids-not-fat.
S.1401	4	7		2.75	8.39	—0.538		Poor in fat and low in solids-not-fat.
S.1402	5	8		3.00	8.42	—0.538		Slightly low in solids-not-fat.
S.1403	4	8		2.80	8.76	—0.538		Poor in fat.
S.1404	4	8		2.80	8.76	—0.533		Poor in fat.

Table 22—continued.

Number	Number of Cows Milked.	Approximate yield, gallons.	Morning or Evening.	Fat per cent.	Solids-not-fat per cent.	Freezing Point (Hortvet) °C.	Taken for comparison with numbers.	Observations.
S.1405	4	9		3.05	8.33	—0.539		Low in solids-not-fat.
S.1406	4	8½		2.90	8.48	—0.542		Poor in fat and slightly low in solids-not-fat.
S.1407	4	8		2.65	8.93	—0.540		Poor in fat.
S.1408	3	6		3.40	8.70	—0.540		
S.1409	3	8		2.60	8.64	—0.542		Poor in fat.
S.1410	3	9		3.10	8.52	—0.541		
S.1411	3	9		3.30	8.60	—0.545		
S.1412	4	8		2.55	8.15	—0.550		Poor in fat and low in solids-not-fat.
S.1413	2	6		2.80	8.96	—0.535		Poor in fat.
S.1414	2	8		3.00	8.64	—0.541		
486	27	10	M	2.75	8.59	—0.536	N.9294	Poor in fat.
487		10		3.32	8.73	—0.537		
488		10		3.35	8.85	—0.537		
489		10		2.90	8.68	—0.536		Poor in fat.
490		5		3.10	8.94	—0.534		
568	31	12	E	4.62	8.60	—0.542	C.148 to C.154	
569		12		4.35	8.55	—0.544		
570		9		4.67	8.52	—0.543		
571	9	10	M	3.30	9.28	—0.535	C.167	
572		5		2.78	8.90	—0.533		Poor in fat.
573		4		2.25	9.21	—0.547		Poor in fat.
491	21	10	E	4.05	8.63	—0.540	N.37	
492		1		4.07	8.77	—0.539		
574	2		M	5.10	8.70	—0.541	C.860	
575	1			4.60	8.70	—0.537		
576	1			4.40	8.84	—0.543		
577	2			3.97	8.45	—0.536		Slightly low in solids-not-fat.
578	2	17		3.50	8.70	—0.535		
579	1			4.60	8.52	—0.536		
580	2			4.92	8.34	—0.547		Low in solids-not-fat.
581	1			4.45	8.29	—0.537		Low in solids-not-fat.
582	1			4.00	8.68	—0.546		

An inspection of table 22 shows that the freezing point depression of the appeal-to-cow samples was determined in every case, and this gave valuable evidence of the authenticity of the samples. Although, as indicated in the next paragraph, a number of the appeal-to-cow samples were naturally poor in solids-not-fat, in no such instance was the freezing point of the sample above -0.530°C (Hortvet), the figure which is usually accepted as the highest freezing point normally given by milk free from extraneous water. The freezing point of the 55 appeal-to-cow samples varied between -0.530°C (Hortvet) to -0.550°C (Hortvet); the average figure being -0.540°C (Hortvet). The average freezing points of appeal-to-cow samples examined during the five years 1953 to 1957 inclusive were -0.540°C ., -0.539°C ., -0.539°C ., -0.539°C and -0.546°C .

A further examination of the results in table 22 makes it obvious that some of the samples did not attain the presumptive limits of 3.0 per cent. for fat and 8.5 per cent. for solids-not-fat laid down by the Sale of Milk Regulations, 1939. In this respect 26 samples contained less than 3.0 per cent. fat and 17 samples contained less than 8.5 per cent. solids-not-fat. It must be remembered, however, that the appeal-to-cow samples listed in the above table were all taken in connection with previous samples of milk which were either adulterated or of unsatisfactory quality; in other words, the high proportion of poor quality appeal-to-cow samples obtained is due to selective sampling and it cannot, therefore, be assumed that the results are indicative of the general quality of milk in Lancashire.

In tables 23 and 24 will be found the analytical results obtained in respect of the 55 appeal-to-cows samples, submitted by County Sampling Officers, arranged to show their frequencies in respect of fat content and solids-not-fat.

Table 23.
Appeal-to-Cow Samples.—Frequencies.

FAT.

Per cent.	Number of Samples.	Percentage of Total Samples.
2.0 	1	1.8
2.2 	2	3.6
2.3 	4	7.3
2.4 	1	1.8
2.5 	2	3.6

Table 23—continued.

Per cent.	Number of Samples.	Percentage of Total Samples.
2.6 	3	5.5
2.7 	6	10.9
2.8 	3	5.5
2.9 	4	7.3
3.0 	3	5.5
3.1 	5	9.1
3.3 	5	9.1
3.4 	1	1.8
3.5 	1	1.8
3.9 	1	1.8
4.0 	4	7.3
4.3 	1	1.8
4.4 	2	3.6
4.6 	4	7.3
4.9 	1	1.8
5.1 	1	1.8
Total ...	55	100.0

Table 24.—Appeal-to-Cow Samples.—Frequencies.

SOLIDS-NOT-FAT.

Per cent.	Number of Samples.	Percentage of Total Samples.
8.1 	2	3.6
8.2 	1	1.8
8.3 	5	9.1
8.4 	9	16.4
8.5 	9	16.4
8.6 	10	18.1
8.7 	9	16.4
8.8 	3	5.5
8.9 	5	9.1
9.2 	2	3.6
Total ...	55	100.0

Milk Supplied to Schools, Day Nurseries, Children's Homes and Hostels for the Aged.

The 317 samples of milk marked "Private" in table 3 were taken from consignments delivered to Schools, Day Nurseries, Children's Homes and Hostels for the Aged in the County. Eleven of these samples were adulterated, corresponding to an adulteration rate of 3·5 per cent. This figure is lower than the total milk adulteration for the County which was 4·3 per cent.

Of the 317 samples, 292 were taken at Schools. Eleven of these were found to be adulterated or otherwise unsatisfactory. Repeat samples taken in respect of nine of these samples were found to be genuine. Of the two remaining samples, one contained minute fragments of broken glass and the other a small flower head. In both cases the respective suppliers were cautioned.

With regard to the 25 remaining samples, 11 were taken at Day Nurseries, four at Children's Homes and 10 at Hostels for the Aged. All these samples were found to be satisfactory.

Samples of Milk deficient in solids-not-fat but genuine.

Attention has already been drawn in the sections of this Report dealing with the "Standards of quality for milk," "Composition of Milk : Frequencies" and "appeal-to-cow" samples, to the fact that milk as it comes from the cow is not always of such quality as to comply with the minimum presumptive limits of 3·0 per cent. for milk-fat and 8·5 per cent. for solids-not-fat, of the Sale of Milk Regulations, 1939. In order to decide whether such samples submitted under the Food and Drugs Act were in fact as given by the cow, and therefore, genuine, it is still necessary in the case of presumed fat deficiencies to make an actual comparison with an "appeal-to-cow" sample from a corresponding milking. Formerly, this was also the only means by which it could be decided whether a sample low in solids-not-fat was of naturally poor quality or whether it had been adulterated by the addition of water. For the past 30 years or so, however, it has been possible by submitting the sample to the Hortvet freezing point test for the Analyst to obtain additional evidence that a deficiency in solids-not-fat was due to the presence of extraneous water or, alternatively, that it was due to natural causes.

In the section of the revised Ministry of Health memorandum 36/Foods (1939), dealing with Public Analysts' quarterly reports, it is laid down that in the case of samples below the presumptive limits of the Sale of Milk Regulations, the report should show whether they were adjudged genuine by the Analyst on other grounds. It is now the normal procedure to submit all samples low in solids-not-fat to the Hortvet freezing point test and to include in the quarterly reports a table giving details of such samples which satisfactorily pass the test.

During the year under review, 564 County samples of milk were found to be poor in solids-not-fat, but were adjudged genuine by the Hortvet freezing point test. This figure corresponds to 10·3 per cent. of the total milk samples (including “ appeal-to-cow ”) submitted by County Sampling Officers. These poor quality milks were distributed over the year as follows :—132 in the March quarter, 106 in the June quarter, 128 in the September quarter and 198 in the December quarter. The samples were not, therefore, confined, to any particular season of the year, although the greatest number was obtained towards the end of the autumn and the lowest in the late spring. The lowest figure for solids-not-fat shown by any of these samples was 7·80 per cent., the next lowest being 7·82 per cent.

Each year it is usual to find an appreciable number of milk samples which are poor in solids-not-fat but are nevertheless adjudged genuine as the result of applying the Hortvet freezing point test. The number of such samples, *viz.*, 10·3 per cent., submitted during the year under review is lower by 0·3 per cent. than for the year 1957, when the figure was 10·6 per cent. In the five years preceding the year 1957 the percentage of milk samples coming under this heading varied from 4·3 to 11·2 per cent.

It will be noted that the percentage of milk samples poor in solids-not-fat but genuine by the freezing point test for the year 1958, *viz.*, 10·3 per cent. is also proportionately very high when compared with the percentage of adulterated milk samples for the same year, *viz.*, 4·3 per cent. The difference is even more striking when it is considered that the last mentioned figure includes all samples containing extraneous water and all samples containing less than 3·0 per cent. milk fat whether or not, in the latter instance, the corresponding appeal-to-cow samples indicated that the fat deficiencies were actually due to abstraction or merely to natural causes.

The relatively high proportion of milks found to be naturally deficient in solids-not-fat, which is by no means confined to Lancashire, is undoubtedly one of the factors which has influenced the Government to appoint a Committee to consider the Composition of Milk. This has previously been mentioned in connection with Standards of Quality for Milk on page 39.

Adulteration of Articles other than Milk.

During the year under review there were examined for the County 2,840 samples other than milk ; of these 174 were reported against, which corresponds to an adulteration rate of 6·1 per cent., which is higher than the figure obtained in the year 1957, when it was 5·6 per cent. The percentage of adulteration in articles other than milk for the year under review, was much higher than that for milk, *viz.*, 4·3 per cent. An examination of tables 3 and 25 shows that the commodities which had a relatively high proportion of unsatisfactory samples, and, therefore,

contributed especially to the overall adulteration rate, included flour, ice-cream, sausages, tincture of iodine, samples containing extraneous matter and samples whose labels did not conform to the requirements of the Labelling of Food Order.

Table 25 gives a list of the articles other than milk submitted by County Sampling Officers which were found to be unsatisfactory with particulars of the type of adulteration and the action taken.

Table 25.

Samples, other than Milk, Adulterated or otherwise giving rise to Irregularity.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
C.9012 ..	Pork Sausages ..	Informal	Meat content 62 per cent.	Slightly poor in meat content.
N.8479 ..	Milk, Condensed, Skimmed, Sweetened ..	Informal	Contents of tin were slightly brown in colour and had an unpleasant odour. Taste was satisfactory and sample was otherwise genuine. Sample was not of good marketable quality and appeared to be old stock.	Supplier communicated with.
E.479 ..	Asparagus Tips, Canned ..	Informal	Contained 320 parts per million of tin.	No further stock available.
N.8523 ..	Malt Extract with Cod Liver Oil ..	Informal	Protein 3.1 per cent. equivalent to 3.45 per cent. in the original malt extract used. Malt extract should contain not less than 4.0 per cent. protein.	Packers agreed to rectify this in future.
E.513 ..	Tincture of Iodine ..	Informal	Iodine 0.29 per cent. and Potassium Iodide 0.21 per cent. below minimum B.P. limits respectively. Appearance of old stock.	Stock withdrawn from sale.
E.510 ..	Gravy Browning ..	Informal	Contained Copper 55 parts per million. Recommended limit 20 parts per million.	Manufacturers communicated with.
N.8539 ..	Pork Sausages ..	Informal	Contained 20 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor interviewed.
S.690 ..	Pork Sausages, Canned ..	Informal	Meat content 62.5 per cent.	Poor in meat content.
N.8525 ..	Unsealed Miniature Bottle of Cherry Brandy ..	Informal	Contained two Blow-flies, one House-fly, one small Fruit-fly and three flies of unidentified species.	The vendor and the importers were cautioned.

Table 25—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
E.584 ..	Tincture of Iodine ..	Informal	Contained Iodine 0.22 per cent. in excess of the maximum B.P. limit.	Remainder of stock destroyed.
C.9130 ..	Linctus of Codeine ..	Informal	Conformed to requirements of the B.P.C. 1954 and not to the current formulation in the B.P.C. supplement.	Vendor communicated with. Presumed to be an only bottle of older stock. Present stock labelled in accordance with B.P.C. 1957 Supplement.
S.838 ..	Tincture of Iodine ..	Informal	Contained Iodine and Potassium Iodide each 0.05 in excess of the maximum B.P. limit.	No action advised.
S.839 ..	Fruit Malt Loaf ..	Informal	Mineral Oil content 0.23 per cent.	See sample No. S.882.
S.863 ..	Tincture of Iodine ..	Informal	Contained Iodine and Potassium Iodide each 0.14 per cent. in excess of the maximum P.B. limit.	Manufacturers communicated with. No further stock available.
N.8664 ..	Blaud's Pills B.P. ..	Informal	Ferrous Iron content 0.025 gramme per pill. Should be not less than 0.028 gramme per pill. Also Blaud's Pill is now deleted from the B.P. but remains in the B.P.C.	Old stock. Sold by shop assistant in error. No further stock available.
S.882 ..	Fruit Malt Loaf ..	Informal	Mineral Oil content 0.25 per cent.	Baker's took steps to reduce mineral oil used as a lubricant for their dough dividers. Same supplier as sample No. S.839.
S.814 ..	Gravy Browning ..	Informal	Sample contained live yeasts and was actively fermenting.	Remainder of stock returned to manufacturers.
N.8714 ..	Beef Sausages ..	Informal	Contained 225 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor interviewed.
S.896 ..	Saccharin Tablets ..	Informal	Saccharin only 0.17 grain per tablet. Requirement of Food Standards (Saccharin Tablets) Order, 1953, is 0.18 to 0.22 grain per tablet.	Old stock. No further stock available.
N.8770 ..	Glycerin of Borax B.P.C. ..	Informal	Glycerin contained 1.0 per cent. excess water.	No action advised.
E.3738 ..	Sugar ..	Informal	Contained 5.8 per cent. salt	Vendor communicated with.
C.9346 ..	Channel Islands Milk ..	Formal	Deficient 10 per cent. fat.	Vendor cautioned. Further sample genuine.

Table 25—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
N.8795 ..	Pork Sausages	Informal	Meat content 59 per cent.	Poor in meat content.
E.3742 ..	Milk, .. Dried	Private (School Kitchen)	Contained brown particles of overheated dried milk amounting to approximately 0·3 per cent., otherwise chemically satisfactory. Good quality skim milk powder should not contain visible particles of overheated milk.	Referred to the department of County Council dealing with contract.
E.802 ..	Chocolate .. Laxative	Informal	Contained only 8·2 per cent. Phenolphthalein compared with 10 per cent. declared and contained 15 parts per million of lead. Sample was rancid and had appearance of old stock.	Old stock. Manufacturers have ceased making this commodity. Stock surrendered for destruction.
S.1088 ..	Glycerin of .. Borax B.P.	Informal	Glycerin of Borax deleted from current B.P. Should be labelled B.P. 1948 or B.P.C.	Vendor communicated with.
S.1095 ..	Glycerin of .. Borax B.P.	Informal	Contained only 10·8 per cent. Borax. Minimum limit in B.P. 1948 and B.P.C. 11·5 per cent., therefore, deficient of 0·7 per cent. of the minimum amount of Borax. Deleted from current B.P. Should be labelled B.P. 1948 or B.P.C.	Vendor communicated with.
E.890 ..	Flour ..	Informal	Creta Praeparata only 157 milligrammes per 100 grammes. Flour (Composition) Regulations, 1956, require 235–390 milligrammes Creta Praeparata per 100 grammes.	Millers increased the feeding-in Rate of Creta Praeparata.
E.3745 ..	Butter ..	Informal	Contained a trace of black amorphous material weighing 2·5 milligrammes of the nature of carbonised organic matter.	No action advised.
T.P. 2 ..	Teacake with .. margarine and Jam	Informal	Contained a pin 29 mm. long weighing 0·103 gramme.	Baker interviewed.
E.3746 ..	Meat and .. Potato Pie	Informal	Contained one dead house-fly	Same vendor. Section 2 Food and Drugs Act, 1955. Fined £10 and £15 costs.
E.3747 ..	Meat and .. Potato Pie	Informal	Contained one dead house-fly	
C.9358 ..	Pork Sausage Meat	Informal	Meat content only 60·5 per cent.	Poor in meat content.
C.9559 ..	Dripping ..	Informal	Consisted of Pork fat. Sold as dripping with a picture of an Ox head on the label.	Existing cartons withdrawn from use.

Table 25—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
C.9581 ..	Ice-Cream ..	Informal	Contained only 6·7 per cent. milk solids-not-fat.	Vendor interviewed. Further sample genuine.
C.9582 ..	Ice-Cream ..	Informal	Contained only 4·6 per cent. fat	Vendor interviewed. Further sample genuine.
S.1285 ..	Cod Liver Oil Emulsion ..	Informal	Acid value of oil 6·1. Vitamin A content of oil 540 I.U's per gm. B.P. limits for Cod Liver Oil acid value 1·2 and Vitamin A 600 I.U's per gm.	Remaining stock withdrawn from sale.
S. 1286 ..	Double Strength Seidlitz Powders ..	Informal	Sample consisted of three powders. Contents of blue packets weighed 19·30 gms. 19·18 gms and 19·26 gms. respectively. B.P.C. limits for blue packets 16·6—18·4 gms.	Packers communicated with.
E. 989 ..	Cod Liver Oil ..	Informal	Acid value 1·5 compared with B.P. limit 1·2. Oil did not taste rancid.	No action advised.
E.1050 ..	Salmon Paste ..	Informal	Fish content 51·0 per cent. Deficient of 27·1 per cent. of the minimum percentage of fish.	See No. E.1257.
C.9622 ..	Sago ..	Informal	Consisted of Tapioca	Vendor notified.
C.9616 ..	Non-brewed Condiment ..	Informal	Contained only 3·5 per cent. acetic acid. Should contain a minimum of 4 per cent. acetic acid.	See No. C.9942.
C.9643 ..	Ice-Cream ..	Informal	Contained only 6·7 per cent. milk solids other than fat.	Vendor interviewed.
S.1415 ..	Portion of Sliced Loaf ..	Informal	Contained a tobacco cigarette which had been partially smoked	Section 2 Food and Drugs Act, 1955. Fined £10 and £7 costs.
E.3748 ..	Part opened tin of Salmon ..	Informal	Contained 11 crystals, weighing in all 59 milligrammes, of struvite (Magnesium ammonium phosphate)	No action advised.
C.9160 ..	Compound Syrup of Hypophosphites ..	Informal	Contained iron equivalent to 0·43 per cent. w/v Ferr. Sulph. whereas formula declared 1·31 per cent. Ferr. Sulph.	Remainder of stock withdrawn from sale.
C.9664 ..	Ammoniated Mercury Ointment ..	Informal	Container not labelled "Poison"	Vendor notified.
C.9668 ..	Dripping ..	Informal	Contained 3·6 per cent. free fatty acids. Should not contain more than 1·5 per cent.	Vendor notified.

Table 25—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
E.1106 ..	Fish Paste ..	Informal	Fish content only 62·0 per cent. Deficient of 11·4 per cent. of the minimum percentage of fish.	Vendor cautioned. Further sample not obtainable.
C.9761 ..	Tapioca ..	Informal	Consisted of Sago	Vendor notified.
S.1566 ..	Dripping ..	Informal	Free fatty acids 1·8 per cent. but taste and odour unaffected.	No action advised.
C.9766 ..	Headache Powders ..	Informal	Average weight of powders 0·811 gm. Average weight of active ingredients 0·742 gm. per powder. Declared 0·610 gm. active ingredients per powder.	Further sample genuine.
E.3749 ..	Bottle of Lemonade (part filled) containing foreign objects ..	Informal	Contained two small fungus coated films of deposit derived from the inner surface of the composition stopper.	Packers interviewed.
E.1257 ..	Salmon Paste ..	Formal	Deficient of 30 per cent. of the minimum percentage of fish.	See E.1287.
E.3750 ..	Piece of Buttered Currant Bun containing a foreign body ..	Informal	Contained an irregularly shaped piece of multi-layered brown paper or cardboard weighing 0·725 gramme.	Baker cautioned.
E.1287 ..	Fish Paste ..	Formal	Deficient of 17·8 per cent. of the minimum percentage of fish	Manufacturer of sample No. E.1257. Prosecution under Section 2 Food and Drugs Act, 1955. Fined £10 and £7 costs.
E.751 ..	Small wrapped sliced white loaf of bread ..	Informal	Contained 1·8 grammes of brown stained dough due to presence of 11 milligrammes of iron oxide.	Baker interviewed.
E.752 ..	Opened packet of Cake Mix Powder containing beetle ..	Informal	Contained one live beetle (Ptinus tectus) 3 mm. in length. Sample otherwise in good condition.	Stock examined.
S.9602 ..	Portion of the Pastry of a Pork Pie ..	Informal	Contained one dead cockroach weighing 0·205 gramme.	Prosecution under Section 2 Food and Drugs Act, 1955. Fined £5 and £8 2s. costs.
N.9264 ..	Pork Sausages ..	Informal	Meat content only 60·0 per cent. Contained 60 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor notified re preservative.

Table 25—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
E.1714 ..	Piece of cake ..	Informal	Cut surface of cake and bottom lining paper contaminated with fungus.	Referred to Local Authority. Stock examined.
E.1353 ..	Muffin (two halves—one containing foreign matter, one buttered)	Informal	Contained 27 milligrammes of partially carbonised dough, otherwise genuine.	No action advised.
C.9899 ..	Ice-Cream ..	Informal	Fat content only 4.4 per cent.	Vendor cautioned. See No. C. 104
C.9900 ..	Ice-Cream ..	Informal	Fat content only 4.5 per cent.	Vendor cautioned. Further sample genuine.
S.1729 ..	Ground Almonds ..	Informal	Acid value of oil 6.0	No action advised.
E.1434 ..	Extra Strong Seidlitz Powders	Informal	Sample consisted of three powders. Contents of blue packets weighed 12.19, 12.27 and 12.16 grammes. Contents of white packets weighed 6.48, 6.42 and 7.21 grammes. B.P.C. limits :—Blue Packets 13.0—14.4 grammes. White Packets 2.25—2.75 grammes.	Packers communicated with. Remainder of stocks withdrawn from sale.
E.1449 ..	Glycerin B.P. ..	Informal	Contained 1.7 per cent. excess water.	Packers undertook to take steps to ensure adequate drying of bottles, after rinsing in future.
C.9951 ..	Channel Islands Milk	Formal	Fat content only 3.95 per cent.	Further sample genuine.
C.9942 ..	Non-brewed Condiment	Informal	Contained only 3.45 per cent. acetic acid. Should contain a minimum of 4.0 per cent. acetic acid.	Same packers as sample C.9616. Packers replaced stock.
S.1788 ..	Ammoniated Mercury Ointment	Informal	Container not labelled "Poison"	Advised vendor be notified
S.1785 ..	Cod Liver Oil B.P.	Informal	Vitamin A content only 500 I.U's per gramme. B.P. requires not less than 600 I.U's per gramme.	Advised stock be withdrawn from sale and packers communicated with.
S.9604 ..	Carrots, Canned	Private (School Meals Kitchen)	Contained 0.22 gramme of used lubricating oil or grease.	Purchasing department informed.
E.753 ..	Swiss Roll containing foreign material	Informal	Sample included a piece of cotton cloth which measured approximately 3½ in. by 1¼ in. and weighed 1.24 grammes.	Prosecution under Sections 2 and 113 Food and Drugs Act, 1955. Fined £5 and £4 18s. costs.

Table 25—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
N.9384 ..	Flavoured Straws ..	Informal	Soluble contents of straws included synthetic colours which should be added to list of ingredients as "colourings."	Suppliers agreed to amend list of ingredients.
E.1453 ..	Tincture of Iodine B.P. 1932 ..	Informal	Contained 2.65 per cent. iodine and 2.70 per cent. potassium iodide. B.P. 1953 maximum limits are 2.55 per cent. for each. B.P. 1932 maximum limits are 2.55 per cent. of iodine and 1.55 per cent. of potassium iodide.	Packers agreed to alter label and withdraw all incorrectly labelled bottles.
E.1478 ..	Gripe Water ..	Informal	Sample appeared to be old stock and had a musty odour and contained traces of sediment.	Referred to Local Authority with a view to surrender of any remaining stock.
N.9440 ..	Ice-Cream ..	Informal	Fat content only 3.6 per cent.	See No. N.9485.
C.29 ..	Headache Powders ..	Informal	Sample consisted of 8 powders. Average weight of active ingredients per powder was 0.721 gramme. (Declared 0.610 gramme).	See samples C.49 and C.66.
C.49 ..	Headache Powders ..	Informal	Sample consisted of 8 powders. Weight of powders varied from 0.633 to 0.900 gramme. Average weight of active ingredients per powder was 0.693 gramme. (Declared 0.610 gramme).	See samples C.29 and C.66
S.1870 ..	Flour Confectionery ..	Informal	Mineral Oil content 0.4 per cent. Content should not exceed 0.32 per cent. from both dried fruit and from lubricant used.	Bakers took steps to rectify quantity of oil used to lubricate dough dividers.
E.1480 ..	Wholewheat Flour ..	Informal	Claimed "Contained the Germ with its natural vitamins" without declaring the nature and amount of the vitamins present.	Packers agreed to alter labels.
S.1909 ..	Channel Islands Milk ..	Formal	Fat content only 3.85 per cent.	Vendor cautioned. Ceased production of Channel Islands milk.
C.66 ..	Headache Powders ..	Informal	Sample consisted of 8 powders. Weight of powders varied from 0.813 to 0.903 gramme. Average weight of active ingredients per powder was 0.773 gramme. (Declared 0.610 gramme).	See samples C.29 and C.49. Packers took steps to prevent a recurrence.

Table 25—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
N.9482 ..	Lemonade Powder ..	Informal	Glucose monohydrate should be placed first and not last in list of ingredients.	Packers agreed to alter labels.
E.754 ..	Sliced white loaf of bread containing foreign object	Informal	Contained a very small unidentified fly approximately 3 millimeters long and weighing 1 milligramme.	Bakers communicated with.
C.104 ..	Ice-Cream ..	Informal	Contains only 4.5 per cent. fat and 7.1 per cent. milk solids other than fat.	Vendor interviewed. See No. C.278.
N.9485 ..	Ice-Cream ..	Formal	Deficient 26 per cent. of the minimum percentage of fat.	Section 2 Food and Drugs Act, 1955. Fined £3 and £4 18s. costs.
E.1658 ..	Milk Condensed, Full Cream, Unsweetened	Informal	Sample showed age-thickening.	Further sample genuine.
S.1968 ..	Flour ..	Informal	Creta Praeparata only 27 milligrammes per 100 grammes. Flour (Composition) Regulations, 1956 require 235—390 milligrammes. Creta Praeparata per 100 grammes.	Millers gave an assurance that every endeavour would be made to ensure the correct mixing in future. Same millers as No. S.2273.
E.1659 ..	Sparkling Orange Drink	Informal	Claimed "... with Sugar and glucose as well." Added sugar (sucrose) approximately 10 per cent. whereas added glucose is not more than 0.3 per cent. as dextrose or 0.6 per cent. as glucose syrup solids. Amount of glucose does not warrant a claim of its presence being made.	Packers agreed to alter labels.
E.755 ..	Pieces of White Bread containing foreign matter	Informal	Contained three pellets of mouse excreta.	Same vendor. Prosecution under Section 2 Food and Drugs Act, 1955. Fined £8 and £3 10s. costs.
E.756 ..	Pieces of White Bread containing foreign matter	Informal	Contained two pellets of mouse excreta.	
C.198 ..	Channel Islands Milk	Formal	Fat content only 3.50 per cent.	Vendor cautioned. No longer selling Channel Islands Milk.
N.9588 ..	Farm Butter..	Informal	Contained 19 per cent. moisture i.e. 3.0 per cent. in excess of the maximum permitted limit.	See No. N.9730.

Table 25—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
C.212 ..	Cough Mixture ..	Informal	Water soluble extract from <i>prunus virginiana</i> mentioned in list of ingredients on box but omitted from list on bottle.	Omission due to printers error. Correct labels now in use.
N.9643 ..	Sausages, Pork ..	Informal	Contained 195 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor interviewed.
S.2196 ..	Fresh Fruit (Lemons) ..	Informal	Sample consisted of lemons in plain wrappers and lemons in printed wrappers. The lemons in the printed wrappers contained 140 parts per million of diphenyl <i>i.e.</i> 40 parts per million in excess of the maximum permitted limit.	Further sample genuine. .
E.1839 ..	Crab, part of opened tin and small box containing particles of glass like substance ..	Informal	Contained crystals of struvite (magnesium ammonium phosphate).	No action advised.
C.278 ..	Ice-Cream ..	Informal	Fat content only 3.7 per cent.	Formal sample genuine.
E.1840 ..	Opened Can of Corn Beef ..	Informal	Contained skin and subcutaneous tissue with adhering bovine hair weighing in all 3.07 gramme.	Packers gave an assurance that steps would be taken to prevent a similar occurrence in future.
E.1859 ..	Flour Confectionery ..	Informal	Filling contaminated with fungus	Referred to Local Authority.
E.1871 ..	Rose Hip and Orange Syrup with Vitamin C ..	Informal	Contained 51 milligrammes Vitamin C per fluid ounce against minimum declaration of 56 milligrammes per fluid ounce.	No further stock available.
E.1872 ..	Chicken Fillets, Canned ..	Informal	Chicken content 73.5 per cent. added water 26.5 per cent. Should be declared as chicken fillets in broth or in stock.	See No. E.1976.
E.1875 ..	Indigestion Tablets ..	Informal	Calcium Carbonate 5 grains per tablet and magnesium as light magnesium carbonate 0.78 grain per tablet. Declared as 0.6716 grain per tablet and 0.078 grain per tablet respectively. Formula appears to be declared at approximately one-tenth of actual constituents.	Packers communicated with. Stock withdrawn from sale.

Table 25—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
S.2273 ..	Flour ..	Informal	Contained only 127 milligrammes of Creta Praeparata per 100 grammes. Flour (Composition) Regulations 1956 require 235—390 milligrammes Creta Praeparata per 100 grammes.	Same millers as Sample S.1968.
S.9605 ..	Part Bottle .. of Sauce	Informal	Contained a dead cockroach.	Plant inspected and manufacturers cautioned.
S.9607 ..	Pieces of .. Sultana Batch Cake	Informal	Contained three pieces of dung weighing in all 1.0 gramme.	Prosecution under Section 2 Food and Drugs Act, 1955. Fined £10 and £8 14s. 6d. costs.
N.9692 ..	Part of loaf .. of Bread	Informal	Contained 5 fragments of dark coloured plastic material weighing in all 16 milligrammes.	Bakers interviewed.
S.9609 ..	Sultana .. Batch Cake	Informal	Contained five vegetable fibres of the nature of jute fibres adhering to top surface of cake.	Bakers interviewed.
S.9606 ..	Part bottle .. of lemonade	Informal	Sample had slight petroleum like taint but paraffin or petrol, if any, less than 5 parts per million.	Manufacturers notified.
E.1976 ..	Chicken .. Fillets, Canned	Informal	Chicken content 75.5 per cent. water 24.5 per cent. Should be declared as Chicken Fillets in broth or in stock or in jelly.	See also sample E.1872. Packers agreed to alter labels.
E.1897 ..	Super .. Enriched Bread	Informal	Poster claimed presence of vitamin D without declaring the minimum quantity present per ounce of the food.	Bakers agreed to alter poster.
S.2341 ..	Ice-Cream ..	Formal	Fat content only 4.2 per cent.	Vendor cautioned.
N.9730 ..	Farm .. Butter	Formal	Water content 24 per cent. Maximum permitted limit 16 per cent.	Vendor interviewed and cautioned.
E.758 ..	Part .. consumed Ice-Lolly	Informal	Copper 50 parts per million.	Manufacturers communicated with. See sample No. E.759.
E.759 ..	Ice Lolly ..	Informal	Copper 45 parts per million.	Manufacturers agreed to re-tin moulds. Same manufacturers as sample E.758.
E.760 ..	Part sliced .. wrapped loaf of bread	Informal	Contained part of dead insect larva 7 millimetres long and weighing 6 milligrammes.	Bakers notified.

Table 25—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
N.9756 ..	Milk, Channel Islands ..	Formal	Deficient of 12·5 per cent. fat.	Prosecution under Regulation 4 Milk and Dairies—(Channel Islands and South Devon Milk) Regulations. Case dismissed.
N.9765 ..	Parrish's Chemical Food ..	Informal	Nineteen per cent. of the iron present had become insoluble. Bottle cap faulty. Appearance of old stock.	Remainder of stock with drawn from sale.
E.1923 ..	Ice-Cream ..	Informal	Fat content only 2·7 per cent.	Formal sample advised. See E.2023.
C.483 ..	Malt and Cocoa Beverage ..	Informal	Sample had caked into a solid mass. Otherwise genuine.	Remainder of stock with-drawn from sale.
S.2342 ..	Baby Food, Strained Egg Custard with Rice ..	Informal	Sample had developed acidity and liquefied. Acidity as lactic acid 0·24 per cent. pH value 5·2 (pH value for normal tins 6·5).	Packers communicated with. Condition of sample probably due to a fault in the fabrication of the can.
S.2356 ..	White Fish Caviar ..	Informal	Contained 550 parts per million Benzoic Acid. Contravention of Public Health (Preservative etc. in Food) Regulations, 1925 to 1958.	Remainder of stock with-drawn from sale.
E.2002 ..	Butter Loaf (Bread) ..	Informal	Butter content 4 per cent. and non fat milk solids 3·5 per cent. yet flour placed last in list of ingredients and butter first.	Manufacturers agreed to alter label.
E.2003 ..	Muffin ..	Informal	Contained 0·85 gramme of dough discoloured with 1·9 per cent. iron oxide.	Bakers cautioned.
N.9879 ..	Opened can of Peas containing foreign matter ..	Informal	Contained two pieces of matted vegetable debris heavily infested with fungus hyphae.	Packers communicated with.
S.2423 ..	Table Jelly ..	Informal	Fruit juice absent but printed illustrations of raspberries on carton.	Packers communicated with. See also samples S.2562, N.79 and S.2812.
S.2429 ..	Mincemeat ..	Informal	Deficient of 3·2 per cent. of soluble solids.	Remaining stocks with-drawn from sale.
E.2023 ..	Ice-Cream ..	Formal	Deficient of 38 per cent. of the minimum percentage of fat.	Section 2 Food and Drugs Act, 1955. Discharged on payment of costs £2 3s.

Table 25—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
N.9847 ..	Flour ..	Informal	Contained Vitamin B1 0.22 milligramme per 100 grammes and nicotinic acid 1.34 milligrammes per 100 grammes (minimum limits 0.24 milligrammes and 1.60 milligrammes respectively).	Same millers. Steps taken to ensure that the required amounts of the vitamins, as required by the Regulations, are present in future.
N.9848 ..	Flour ..	Informal	Contained nicotinic acid 1.34 milligrammes per 100 grammes (minimum limit 1.60 milligrammes per 100 grammes).	
C.606 ..	Milk, Malted ..	Informal	Milk fat content only 6 per cent. Should contain not less than 7 per cent. milk fat.	No further stock available.
N.9907 ..	Pork Sausage	Informal	Contained 65 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor notified.
E.2145 ..	Pork Sausage	Informal	Meat content only 56.5 per cent.	Poor in meat content.
E.2174 ..	Beef Sausage ..	Informal	Contained 165 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor notified.
S.9611 ..	Rice ..	Informal	Contained a pellet and two fragments of mouse excreta weighing in all 25 milligrammes.	Prosecution under section 2 Food and Drugs Act, 1955. Costs £2 13s. 11d.
S.9612 ..	Rice ..	Informal	Contained one pellet of mouse excreta weighing 8 milligrammes.	Same packer as sample S.9611.
E.763 ..	Part Loaf of White Bread containing foreign matter.	Informal	Contained 45 grammes of dough discoloured by 0.11 per cent. mineral oil and 136 parts per million Iron.	Bakers interviewed.
S.2562 ..	Table Jelly ..	Informal	Fruit juice absent but printed illustration of raspberries on carton.	Same manufacturers as samples S.2423, N.79 and S.2812.
E.2196 ..	Beef Sausage ..	Informal	Contained 230 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor interviewed.
C.751 ..	Table Jelly Crystals with fruit juices.	Informal	Fruit Juice content in finished table jelly sweet not more than 0.3 per cent.	No further stock available.

Table 25—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
E.764 ..	Part of a Bilberry Fruit Tart containing a beetle ..	Informal	Contained the thorax and abdomen of a beetle weighing 0.3 gramme.	Bakers and importers of the fruit communicated with. Importers of fruit gave an assurance that all possible steps would be taken to obviate such occurrences in future.
C.748 ..	Almonds, Ground ..	Informal	Acid value of extracted oil 5.6	No action advised.
E.2215 ..	Pork Sausage ..	Informal	Contained 270 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor interviewed.
S.2600 ..	Christmas Pudding ..	Informal	Pudding contained only 7.8 per cent. fat. Christmas Pudding should contain not less than 9.0 per cent. fat.	Manufacturers agreed to increase fat content. See also sample No. N.154.
C.821 ..	Rice ..	Informal	Sample contained 2 live and 1 dead grain weevils.	Rémainder of stock withdrawn from sale.
N.44 ..	Mincemeat ..	Informal	Surface of sample lightly contaminated with mould.	Referred to Local Authority.
S.9616 ..	Dried Peas together with a piece of glass stated to have been in another packet. ..	Informal	The packet contained a piece of colourless glass weighing 0.55 gramme. Another piece of glass stated to be from a similar packet weighed 0.89 gramme but was of different colour and density.	Packers cautioned.
E.2282 ..	Gravy Browning ..	Informal	Contained 120 parts per million of Zinc. Recommended limit 50 parts per million.	Stock withdrawn from sale.
C.2499 ..	Lemonade, Part Bottle ..	Informal	Composition stopper of bottle yielded traces of sulphuretted hydrogen with dilute citric acid. Lemonade had slight sulphide odour (less than 3 parts per million of H ₂ S).	Manufacturers interviewed
N.45 ..	Cut Mixed Peel ..	Informal	Contained 27 parts per million of copper. Recommended limit 20 parts per million.	Packers discontinuing sale of this commodity. See also sample S.2845.
S.2691 ..	Malt Extract and Vitamin Compound. ..	Informal	Acid value of oil 43.	Packers communicated with.
S.2701 ..	Piccalilli ..	Informal	Cauliflower mentioned in list of ingredients but not included in Piccalilli	Packer interviewed. Omission of cauliflower due to error in packing.

Table 25—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
E.2310 ..	Fruit Salad, .. canned	Informal	Ingredients listed in wrong order. Pears in excess of apricots.	No action advised.
E.2325 ..	Tincture of .. Iodine B.P.	Informal	Contained potassium iodide 0.13 per cent. in excess of maximum B.P. limit.	Packers communicated with.
N.76 ..	Channel .. Islands Milk	Formal	Deficient 5 per cent. fat.	Vendor cautioned. Further sample genuine.
N.61 ..	Cut Mixed .. Peel	Informal	Contained 25 parts per million Copper. Recommended limit 20 parts per million.	Packers undertook to take steps to prevent a recurrence.
N.79 ..	Table Jelly ..	Informal	No evidence of lemon juice present although illustrations of lemons prominently displayed on packet.	Same manufacturer as samples S.2433, S.2562 and S.2812.
S.2740 ..	Fruit Salad, .. canned	Informal	Apricots and pears present in greater quantity than peaches which are listed first in statement of ingredients.	No action advised.
E.2326 ..	Ascorbic .. Acid Tablets	Informal	Consisted of 25 milligrammes tablets. Box marked with handwritten declaration "50 milligrammes."	Box marked "50 milligrammes" in error.
E.2358 ..	Tincture of .. Iodine B.P.	Informal	One ounce bottle contained only 22 mls. Iodine 0.85 per cent. and Potassium Iodide 0.77 per cent. in excess of maximum B.P. limit.	Vendor interviewed.
N.111 ..	Ground .. Almonds	Informal	Acid value of oil 50.6 and sample had unpleasant flavour.	Stock withdrawn from sale.
S.2812 ..	Jelly, Table ..	Informal	No evidence of Greengage juice present although illustration of Greengages prominently displayed on packet.	Same manufacturers as samples S.2423, S.2562 and N.79.
N.154 ..	Christmas .. Pudding	Informal	Pudding contained only 7.95 per cent. fat.	Same manufacturers as sample S.2600.
E.766 ..	Part carton .. of Ginger Nut biscuits and two fragments of suspected glass.	Informal	Contained numerous fragments of broken glass weighing in all 0.788 gramme.	Section 2 Food and Drugs Act, 1955. Fined £25 and £7 costs.
C.1029 ..	Mincemeat ..	Informal	Contained three twisted strands of Jute fibres $3\frac{1}{4}$ inches long.	Packers cautioned.

Table 25—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
N.191 ..	Channel Islands Milk ..	Formal	Deficient 6·2 per cent. fat	Vendor cautioned. Further sample genuine.
S.2845 ..	Candied Peel..	Informal	Contained 22·5 parts per million of Copper. Recommended limit 20 parts per million.	Same packers as sample N.45.
S.2989 ..	Peas, Dried ..	Informal	Contained two small live grubs and a few damaged peas.	Stock surrendered.
E.767 ..	Small piece of Cake containing foreign matter. ..	Informal	Contained two small flakes of carbonised crust or dough, otherwise genuine.	No action advised.
N.208 ..	Part of Sliced Loaf containing dark coloured object ..	Informal	Contained 0·42 grammes of dough discoloured with iron and iron oxide. Some cotton fibres also present. Labelled "Milk-white Bread." Yet no milk solids detected.	Bakers agreed to alter label and to take every precaution to avoid any extraneous matter in their product in future.
N.229 ..	British Sherry ..	Informal	Contained only 26·5 per cent. proof spirit compared with 28·0 per cent. declared on label.	Bottlers took steps to prevent a recurrence.
S.2893 ..	Glycerin B.P. ..	Informal	Contained 0·4 per cent. excess water.	No action advised.
E.769 ..	Opened small tin of Strained Chocolate Pudding. ..	Informal	Acidity (as Lactic Acid) 0·30 per cent. Contents curdled, unpleasant odour and taste and can defective at junction of lid and seam.	Packers agreed to take all possible steps to eliminate the possibility of a similar occurrence in the future.

THE LABELLING OF FOOD ORDER.

The first Labelling of Food Order was made in the year 1944, but it has been amended or re-enacted on several occasions since that time. The Order at present in force is the Labelling of Food Order, 1953, which came into operation on the 5th April of that year and which has been kept in force by the Twelfth Schedule of the Food and Drugs Act, 1955. Two amending Orders to the Labelling of Food Order, 1953, were made in the years 1953 and 1955 and a further amending Order was made in the year under review and is mentioned under new legislation on page 8 of this report.

During the year under review, 35 samples (18 County and 17 from Autonomous Authorities) were found to contravene the requirements of the Labelling of Food Order. Brief details of the 18 County samples will be found in table 25. Of the total number of samples to which exception was taken 18 (six County) had labels which did not disclose one or more of the following requirements; the name and address of the packer, the true name of the food or a correct list of ingredients. In each of the above instances, the packers were communicated with and their attention drawn to the requirements of the Order. During the previous year, 1957, the number of samples which contravened the Labelling of Food Order was very similar, *viz.*, 26 County samples and eight from Autonomous food and drugs authorities. In addition, six samples submitted by Autonomous Authorities during 1958 bore no declaration (or an incorrect declaration) of the net weight and these were brought to the attention of the weights and measures Inspectors concerned.

In the following paragraphs reference is made to a number of the more interesting samples, in relation to their labels, submitted by County Sampling Officers and by Autonomous Food and Drugs Authorities.

Dripping, Sample No. C.9559.

This informal sample was sold prepacked in a carton on which the contents were described as "dripping" and on which a picture of an ox-head was printed. Upon analysis, however, the sample was found to consist of hog fat. Although the word dripping may be applied generally to the fat obtained during the roasting of meat, it was more specifically defined, in the now revoked Oils and Fat Order, 1953, as the fat obtained by the rendering or processing of the fat or bones of sheep or oxen. In view of the composition of the sample the picture of an ox-head was particularly misleading. The packers were communicated with and the offending cartons were withdrawn from use.

Wholewheat Flour, Sample No. E.1480.

This prepacked sample bore on the label the following statement "Contains the Germ with its natural Vitamins." The label did not, however, specify the Vitamins present nor did it state the minimum quantity of each Vitamin present per ounce of the flour. The Flour (Composition) Regulations, 1956, lay down minimum standards for certain nutrients including Vitamin B1 and Nicotinic Acid, in all flours. In view of these standards being prescribed, flour may be sold without a declaration of the ingredients appearing on the label, as required for the majority of pre-packed foods under Article 4 of the Labelling of Food Order, 1953. This exemption, however, does not extend to Article

9 of the Order which relates to claims of the presence of vitamins or minerals. The packers were communicated with and, after some correspondence, they agreed to amend their label.

Sparkling Orange Drink, Sample No. E.1659.

The label on the bottle in which this sample was submitted bore the claim “. . . with sugar and glucose as well.” Upon analysis the sample was found to contain approximately 10 per cent. added sucrose but the added glucose was found to be not more than 0·3 per cent. as dextrose or 0·6 per cent. as glucose syrup solids. The manufacturers were communicated with and it was pointed out that, in your Analyst's opinion, the very small amount of glucose present did not warrant a claim of its presence being made. The manufacturers agreed to delete any reference to glucose from the label.

Chicken Fillets, canned, Samples No's E.1872 and E.1976.

These were informal samples of the same brand which were found upon analysis to contain 26·5 per cent. and 24·5 per cent. of added water respectively ; the chicken contents being 73·5 per cent. and 75·5 per cent. respectively. The packers were communicated with and informed that where chicken was packed in jelly, broth or stock, the name applied to the product should clearly indicate this. For example, this product might be described as “Chicken Fillets in Chicken Jelly” but not simply as “Chicken Fillets.” In their reply the packers stated that their attention had already been drawn to the label in question and they had given instructions for it to be amended as indicated above. It is of interest to note that the action taken in regard to these samples is compatible with the agreement which has been reached between the Food Manufacturers' Federation Incorporated and the Association of Public Analysts with regard to the composition and labelling of certain poultry and meat products. As indicated earlier in this report, however, the agreement just mentioned is not operational before the 1st July, 1959.

Super Enriched Bread, Sample No. E.1897.

In the shop from which this sample was purchased there was exhibited a poster which claimed in respect of the bread that it, “contains Milk Solids, Sugar, Butter, Lard and Vitamin “D””. No objection to this claim was made on analytical grounds but the attention of the bakers was directed to the fact that the claim in respect of Vitamin D should have been accompanied by a declaration stating the minimum number of International Units of Vitamin D present in each ounce of the bread. The poster was immediately amended to comply with the requirements of the Labelling of Food Order.

Milk-White Bread, Sample No. N.208.

This sample was submitted on complaint that it contained some foreign matter, which was found to consist of Iron and Iron Oxide and some cotton fibres, which had discoloured approximately 0·4 gramme of the crumb of the loaf. On enquiry it transpired that there had been a mechanical break-down of machinery at the bakery and the slight contamination had resulted from this. In view of the name applied to the bread the sample was also examined for the presence of milk solids but these were found to be absent. The attention of the bakers was directed to the possible misleading nature of the name applied to the loaf and they agreed to rename the bread.

Pure Malt Vinegar, Sample No. 161.

This sample was submitted for examination by an Autonomous Food and Drugs Authority. Upon analysis it yielded the following results :— Total Solids 0·065 per cent., Mineral Matter 0·012 per cent., Acidity (as Acetic Acid) 5·0 per cent. w/v, Oxidation value 2,000, Iodine Value 1,060 and Ester Value 44. The sample was also coloured with caramel although no declaration to this effect was made on their label. The above results are not indicative of ordinary malt vinegar but are consistent with the sample consisting of distilled malt vinegar coloured with caramel and it should have been described as such. The packers were communicated with and they stated that should they again pack distilled malt vinegar they would label it correctly.

Garden Peas, Canned, Sample No. 3349.

This sample also was submitted by an Autonomous Food and Drugs Authority. The canned peas had been imported and the cans bore the following declaration ; “ Fresh Garden Peas with Sugar, Salt, Vegetable Colouring Matter. Flavouring added.” Upon examination, however, the colouring matter in the peas was found to consist of two coal tar colours, viz., blue V.R.S. and yellow 2 G. The Labelling of Food Order requires such colours when forming an ingredient of a food to be designated simply as “ colourings,” or they may be described as “ synthetic colours ” or “ artificial colours.” It is clearly misleading to describe them as “ vegetable colouring matter ” even if they are used to colour vegetables. The packers were communicated with and they agreed to amend the label.

ICE-CREAM.

The first Standards Order for ice-cream was made in March, 1951, but due to shortages of fats and milk powder it was soon found impossible to maintain the standard then formulated without reducing supplies of ice-cream. The Minister of Food, therefore, introduced, as a temporary

measure, reduced standards for fat and milk solids other than fat in July, 1952. During the year 1953, the supply position improved and the Food Standards (Ice-Cream) Order, 1953, which came into operation on the 1st June, 1953, restored the original standard fixed in the year 1951. This standard was still in operation in the year 1958 and is as follows :—

“ 1. Ice-cream shall contain not less than five per cent. fat, 10 per cent. sugar and $7\frac{1}{2}$ per cent. milk solids other than fat :

Provided that—

(i.) ice-cream containing any fruit, fruit pulp or fruit puree shall either conform to the standard set forth above or, alternatively, the total content of fat, sugar and milk solids other than fat shall be not less than 25 per cent. of the ice-cream including the fruit, fruit pulp or fruit puree, as the case may be, and such total content of fat, sugar and milk solids other than fat shall include not less than $7\frac{1}{2}$ per cent. fat, 10 per cent. sugar and two per cent. milk solids other than fat :

(ii.) ‘ Parev ’ (kosher) ice sold, offered or exposed for sale under that description shall contain not less than 10 per cent. fat and not less than 14 per cent. sugar, and the standard for ice-cream set forth above shall not apply to this product.

“ 2. For the purpose of the standards prescribed above ‘ sugar ’ means sucrose, invert sugar or the solids of any sweetening material derived from starch so however that no ice-cream shall contain less than $7\frac{1}{2}$ per cent. sucrose.

“ 3. Each reference in this Schedule to any proportion or percentage means that proportion or percentage by weight.”

When the above standard was first introduced in 1951 the Food Standards Committee of the Ministry of Food stated that it was not ideal and that it should be amended and improved as supplies of ingredients became more plentiful. In December of the year 1957 a report of the Food Standards Committee on the Ice-Cream standard was published in which the Committee recommended, in view of present day conditions and current commercial practice, that the Food Standards (Ice-Cream) Order, 1953, should be amended*as follows :—

(a) To provide that the description “ dairy ice-cream ” (and variants likely to suggest the use of dairy ingredients) may only be applied to ice-cream in which the whole of the fat content is milk fat.

*Subsequent to the year under review, i.e. in March, 1959, new ice-cream standards were made in the Food Standards (Ice-Cream) Regulations, 1959, which came into operation on the 27th April, 1959. At the same time the Labelling of Food (Amendment) Regulations, 1959, were made and these impose certain requirements as to the labelling of ice-cream. Both these regulations will be mentioned in detail in the report for the year 1959.

(b) To provide a standard for "milk-ice" of not less than $2\frac{1}{2}$ per cent. of milk fat, not less than seven per cent. of milk-solids-not-fat and no fat other than milk fat.

(c) To revoke the present provisions relating to the sugar content of ice-cream but to include a prohibition on the use of saccharin and other artificial sweetening agents in ice-cream (including that containing fruit), milk-ice and "Parev" (Kosher) ice.

(d) To prohibit the use of milk or milk products in "Parev" (Kosher) ice.

In addition to the above recommendations the Food Standards Committee is investigating the possibility of including in the standard a provision relating to overrun *i.e.*, the increase in volume of the ice-cream which occurs during freezing due to the whipping in of air. This increase in volume is expressed as a percentage of the original volume of the mix and may be from 20 to 100 per cent., or even more. Ice-cream is sold by volume although the present standard is based on weight. It follows that the food value of the ice-cream as purchased in the frozen state depends not only on the standard but also on the degree of overrun. While no standard for ice-cream which ignores the question of overrun can be regarded as complete the Committee feel that they are not satisfied, at present, that a provision for the measurement of overrun could be properly enforced particularly in regard to the taking of a divided sample and the keeping of the various portions in their original state. In respect of the third part of the sample this might entail storage for several months. Until their investigations show that the problem of overrun can be satisfactorily dealt with, the Committee considered that no change should be made in the present standards for the fat content and the milk-solids-not-fat content of ice-cream.

It will be noted from table 26 that the average fat content of ice-cream during the year under review has increased by 0.2 per cent. when compared with the previous year so that the general improvement in the fat content of ice-cream found over the last 10 years, is still maintained. A perusal of the table shows that the average fat content in 1946 was only 2.3 per cent. whereas for the years 1954 and 1956 it was 9.2 per cent., in 1957, the figure was 8.7 per cent. and for 1958, it was 8.9 per cent. Furthermore, the lowest fat content during 1957, was 3.0 per cent. and in 1958 2.7 per cent. ; whereas in the four years 1946 to 1949 fats as low as 0.3 and even 0.1 per cent. were found. Table 26 shows the results for all samples of ice-cream examined in the County Laboratory whether submitted by County Sampling Officers or by Autonomous Food and Drugs Authorities. A further rather interesting point emerges if the samples are subdivided into those submitted by the County and those submitted by Autonomous Authorities when the average fat content of County

samples for the year is found to be 8·5 per cent., while the average figure for the Autonomous Food and Drugs Authorities samples is 9·5 per cent. The difference in the figures is almost certainly due to a greater proportion of samples having been obtained from small makers in the County area than in the Autonomous areas. Generally speaking, the small manufacturer uses an ice-cream mix containing less fat by weight but at the same time his product usually has far less overrun than that of the big manufacturer. As already indicated this difference in overrun in a commodity sold by volume tends to cancel out the difference in fat content of the two types of ice-cream.

The average fat content of ice-cream has increased in a striking manner since 1946, but the increases noted since 1948 were, in the first place, due to the action of the Ministry of Food in allocating from November, 1948, additional supplies of sugar, and in certain cases fats, to those ice-cream manufacturers who, at that time, undertook to include at least 2·5 per cent. fat in their ice-cream. This step to increase the quality of ice-cream was taken more than two years before the first statutory standard for ice-cream was made.

During the year, 1958, 111 samples of ice-cream were submitted for chemical analysis, 63 by County Sampling Officers and 48 by Autonomous Food and Drugs Authorities. Although no harmful ingredients were found in any of the samples, 12 (all County) reported upon adversely, did not comply with the Food Standards (Ice-Cream) Order. In the year, 1957, 13 samples were reported upon adversely. Of the 12 unsatisfactory County samples, nine were deficient in fat, one deficient in fat and milk solids other than fat and two were deficient in milk solids other than fat. Details of the incorrect samples, together with the action taken will be found in table 25. From an examination of this table it will be seen that sample, No. N.9485 had a fat deficiency of 26 per cent., and sample No. E.2023, had a fat deficiency of 38 per cent. Legal proceedings, under Section 2 of the Food and Drugs Act, 1955, were instituted against both the vendors. The vendor of sample No. N.9485, was fined £3 and £4 18s. costs and the vendor of sample No. E.2023, was discharged on payment of £2 3s. costs.

The average figures found for the 111 samples were—total solids 33·8 per cent. (maximum 42·1 ; minimum 25·3) and for fat content 8·9 per cent. (maximum 15·6 ; minimum 2·7). These figures as will be seen from the following table, which includes figures for the last 13 years, show that the big improvement noted in the year 1950 has been maintained. It will be remembered that prior to the war a figure of eight per cent. was suggested by a trade association as a minimum standard for fat content and it is interesting to note that during the year under review, 68 samples out of the total of 111 showed fat contents varying from 8·1 to 15·6 per cent.

Table 26.
Ice-Cream.

YEAR.		Number of Samples	Fat Content Average %	Total Solids Average %	Highest Fat %	Lowest Fat %	Highest Total Solids %	Lowest Total Solids %
1946	...	45	2.3	22.5	10.7	0.1	36.8	13.3
1947	...	59	3.0	23.6	10.6	Less than 0.1	39.2	14.1
1948	...	53	3.9	25.3	11.3	0.1	33.4	18.9
1949	...	171	6.4	29.3	13.3	0.3	45.9	14.7
1950	...	186	8.5	32.1	14.7	2.2	43.0	20.1
1951	...	230	8.6	32.6	15.6	3.3	40.7	23.0
1952	...	143	9.0	32.8	13.7	2.0	40.0	19.6
1953	...	130	8.6	32.7	15.2	2.5	42.3	23.3
1954	...	90	9.2	34.6	13.8	3.1	44.0	24.8
1955	...	95	8.1	33.2	13.3	3.5	40.9	24.3
1956	...	94	9.2	34.0	16.4	3.6	43.6	26.3
1957	...	99	8.7	33.3	14.7	3.0	41.9	22.9
1958	...	111	8.9	33.8	15.6	2.7	42.1	25.3

ICE LOLLIES.

During the year under review 14 samples of ice-llies were submitted for examination under the Food and Drugs Act. Four of the samples were submitted by County Sampling Officers, the remaining 10 samples being from an Autonomous Food and Drugs Authority. Unlike ice-cream there is no statutory standard for the composition of ice lollies. They are specifically excluded from the provisions of the Food Standards (Ice-Cream) Order while the Food Standards (Soft Drinks) Order refers only to liquid soft drinks although ice lollies are, in general, similar in composition to soft drinks. Ice lollies and ice-cream are, however, both specifically mentioned in the revised reports on lead and arsenic of the Food Standards Committee of the Ministry of Food which were published in the years 1954 and 1955 respectively. In these reports maximum limits of only one part per million for lead and 0.5 part per million for arsenic (as As) are recommended for both types of commodities. The limits for the majority of other foods being two parts per million and one part per million respectively. In addition to the special recommended

limits for lead and arsenic referred to above there are also general recommended maximum limits for two other toxic metals in foods, *viz.*, copper 20 parts per million and zinc 50 parts per million. Of the 14 samples of Ice Lollies, three (two County) were reported upon adversely. Informal sample No. E.758, consisted of a part consumed Ice Lolly submitted on complaint of having caused sickness. On examination it was found to contain Acidity (as Citric Acid) 0.49 per cent., Copper 50 parts per million and Zinc 10 parts per million. A further sample, No. E.759 of a whole Ice Lolly from the same supply was found to contain Acidity (as Citric Acid) 0.49 per cent., Copper 45 parts per million and Zinc 10 parts per million. In view of the excess Copper found in these two samples the manufacturers carried out an investigation into the condition of the moulds and other equipment and resulting from this all the moulds were retinned. The remaining sample, which was submitted by an Autonomous Authority, was found to contain 2.5 parts per million of Lead. As the result of an investigation by the Food and Drugs Authority of the manufacturers area it was discovered that a mixing tank and some soldered moulds were the cause of the excess Lead found in this sample. Both the mixing tank and moulds were discarded and further contamination was not anticipated.

The total solids (sugars, etc.) in the samples ranged from as little as 2.4 per cent. to 20.8 per cent. with an average for the 14 samples of 10.8 per cent. The average total solids on 19 samples examined in the previous year was 11.5 per cent. while the range of total solids obtained in the years 1952, 1953, 1954, 1955, 1956 and 1957 were very similar to the figures given above for the year under review.

SAUSAGE, MEAT PASTE AND FISH PASTE.

On the 1st March, 1953, the last of the Meat Products Orders was revoked and this had the effect of removing all restrictions, for control purposes, on the price and composition of both pork and beef sausages. It should be noted, however, that the Orders mentioned above were made by the Minister of Food for the purpose of controlling the sale of certain commodities which were, or had been, in short supply. In view of the increased supplies of meat available subsequent to February, 1953, it would appear reasonable to expect that sausages should now have at least the same meat content as in the days of control and short supply and successful prosecutions were instituted by the County, in the years 1953, 1954 and 1955, following the revocation of the Meat Products Orders, in respect of samples of pork sausages found to be seriously deficient in meat. In these cases taken under Section 3 of the Food and Drugs Act, 1938, the Courts accepted the opinion of your Analyst that genuine pork sausage must contain not less than 65 per cent. of meat.

During the year 1956, however, the position was rendered difficult by the results of two Appeal cases in which the judgments went against the prosecution. In the case of *Marston v. Loney* heard in October, 1955, the standard suggested by the Public Analyst was based on the standard previously fixed under the Meat Products Order which had by then been revoked. No other evidence as to a standard was given. In the other case of *Thrussell v. Whiteman* in January, 1956, the Lord Chief Justice said "The sooner it is seen that these cases lead to chaos and it is prescribed what a sausage is the better," he also thought that it depended on the price. This last is quite a new concept in deciding whether a particular food is genuine and up to standard so far, at least, as the Food and Drugs Act is concerned. While successful prosecutions have been taken by some Food and Drugs Authorities subsequent to the above Appeal cases there is no doubt that it is now difficult to obtain convictions particularly in the case of sausages which are relatively cheap in price.

In view of the position described in the previous paragraph it was gratifying to find that the Food Standards Committee of the Ministry of Agriculture, Fisheries and Food after hearing evidence from all branches of the sausage trade and from organisations concerned with the enforcement of food and drugs legislation, recommended, in a report published in June, 1956, that statutory standards should be fixed for sausages. The recommendations included: (a) a minimum standard of 65 per cent. meat for sausages made wholly or mainly with pork and 50 per cent. meat for all other meat sausages; (b) the proportion of fat not to exceed 50 per cent. of the total meat content; (c) the standards to apply to uncooked sausages, sausage meat, skinless sausages, chipolatas and slicing sausages; (d) the sale of sub-standard sausages to be prohibited. The majority of the Food Standards Committee considered that the description "Pork Sausage" and "Beef Sausage" should apply where at least four-fifths of the meat content consisted of the named meat but some members of the Committee considered that these names should only apply when the whole of the meat content consists of the named meat. The Committee also recommended that at least one-and-a-half pounds of sausage should be purchased when it was intended to obtain a divided sample for analysis. The report contains tables which show the variation in price and meat content of pork and beef sausages over the previous three years and the distribution of some 11,000 samples grouped in regard to price and meat content. The figures which are based on the results of samples analysed by Public Analysts throughout the country show that there is no significant relationship between price and meat content. In view of the Food Standards Committee's recommendation that Statutory Standards should be fixed for sausages and, notwithstanding the view expressed by the Lord Chief Justice, the disquieting

evidence from the returns made by Public Analysts that no direct relationship existed between meat content and price, it is particularly disappointing that the Minister of Agriculture, Fisheries and Food should have to inform the House of Commons, in March of the year under review that, because of technical difficulties and because of established trade custom, he was unable to take any action on the Food Standards Committee report.

The last Meat Products Order, revoked on the 1st March, 1953, in addition to controlling price and meat content, also prohibited the use of certain specified offals in the preparation of sausages and other uncooked open meat products intended for human consumption. The restriction on the use of these offals was re-enacted in the Offals in Meat Products Order, 1953, which came into operation on the 1st March, 1953, and this Order provided that proceedings for an infringement might be brought by a Food and Drugs Authority without the consent of the Minister of Food. The Food Standards Committee in their report on sausages recommend that this Order be retained.

The compositions of meat paste and of fish paste are controlled by the Food Standards (Meat Paste) Order, 1951, and the Food Standards (Fish Paste) Order, 1951. The standard for meat paste is a minimum of 55 per cent. meat and for fish paste a minimum of 70 per cent. fish. The standards apply to both imported and home produced products.

During the year 1958, 80 samples of sausage, two of sausage meat, three of canned sausage, two canned sausages with Beans, one Chipolata, two Vienna (canned), one Frankfurter (canned) and one cooked sausage, were examined as against 109 samples of sausages and 23 samples of canned sausages, etc., in the previous year. Sixty-two samples were examined for the County (including two sausage meat, two canned and two canned with beans) and 30 (including one canned, one Chipolata, two Vienna (canned), one Frankfurter and one cooked) for Autonomous Food and Drugs Authorities. Of the total number of sausage samples submitted during the year under review, 33 consisted of Beef (including one sausage meat) and 49 of Pork (including one sausage meat). Eleven County samples and eight submitted by other Food and Drugs Authorities were reported upon adversely. A perusal of table 25 will show that while four of the County samples (including one sausage meat) were poor in meat the deficiencies were not serious. Fourteen of the samples examined including eight County samples, contained normal amounts of sulphite preservative but without any declaration of the presence of preservative being made on the label or exhibited in the shops concerned. This is contrary to the requirements of the Public Health (Preservatives, etc., in Food) Regulations, 1925-1958. Details of all the adulterated County samples together with the action taken, will be found in table 25.

It is interesting to note that the average meat content of 32 samples of beef sausage examined in the County Laboratory during the year 1958 was 58·5 per cent., while the average meat content of 48 samples of pork sausage examined over the same period was 69·4 per cent. Bearing in mind that the standards before the 1st March, 1953, under the Commodity Control Order, were a minimum of 50 per cent. meat for beef sausage and beef sausage meat and a minimum of 65 per cent. meat for pork sausage and pork sausage meat, the average figure obtained in the County Laboratory during the year 1958 for beef sausages is very satisfactory. In fact of 32 samples of beef sausage only two contained less than 50 per cent. meat. With regard to pork sausage the average results are also satisfactory, there being an increase of 3·9 per cent. on the average figure obtained in the previous year. It will be remembered that the average meat content for 62 samples submitted during the year 1957 was 65·5 per cent. Of the 48 samples of pork sausages submitted during the year 1958, six (or 12 per cent.) contained less than 65 per cent. meat. Although this cannot be regarded as satisfactory it must be emphasised that it cannot be assumed that the position with regard to pork sausage has deteriorated since control was removed at the beginning of the year 1953. Fifty per cent. of the pork sausage samples submitted in each of the years 1951, 1952 and 1953 were reported upon adversely and the proportions of unsatisfactory samples for the years 1954, 1955, 1956 and 1957 were 39 per cent., 24 per cent., 32 per cent. and 26 per cent. respectively.

Fifteen samples of meat paste (11 submitted by County Sampling Officers and four by Autonomous Authorities) were examined during the year and all were found to be satisfactory.

With regard to fish paste, 30 samples (20 County) were submitted for examination during the year and, of these, six (four County and two from an Autonomous Authority) were reported upon adversely. An informal County sample, No. E.1050, was found to be deficient of 27·1 per cent. of the minimum percentage of fish and a formal follow-up sample No. E.1257, was deficient of 30 per cent. of the minimum percentage of fish. A further formal sample, No. E.1287 was taken on delivery to the vendor of the two previous samples and, this was found to be deficient of 17·8 per cent. of the minimum percentage of fish. A prosecution under Section 2 of the Food and Drugs Act, 1955, was instituted against the manufacturer in respect of this last sample and he was fined £10 and £7 costs. Informal sample No. E.1106, was found to be deficient of 11·4 per cent. of the minimum percentage of fish and the vendor was cautioned. Of the two informal samples received from an Autonomous Authority, one was found to be deficient of 28·6 per cent. of the minimum percentage of fish. The vendor was interviewed and this commodity is now sold as Sandwich

Spread. With regard to the remaining sample, which was deficient of 14.3 per cent. of the minimum percentage of fish, the manufacturer was cautioned and a further sample was found to be genuine.

FRESH FRUIT.

In previous reports, attention has been directed to the necessity which now exists for examining fresh fruit for added chemicals. This arises mainly from the extensive use of insecticidal sprays by growers and of anti-mould agents by packers for the purpose of ensuring better crops and the marketing of sound produce. It is one of the duties of the Public Analyst to see that no harmful quantity of any chemical residue remains on fruit or other food when it is offered for sale and that existing regulations are complied with ; in particular, the Public Health (Preservatives, etc., in Food) Regulations and the Mineral Oil in Food Order. Fruit, particularly apples, may contain excessive amounts of lead and arsenic from the use of lead arsenate sprays and citrus fruits have been known to contain thiourea, boron preservative and mineral oil as well as the permitted chemical diphenyl. As mentioned at the beginning of this report two amendments to the Preservative Regulations were made during the year under review and these now permit specified amounts of another chemical, ortho-phenylphenol, to be present in citrus fruits, apples, pears, pineapples, peaches and melons.

During the year, 1958, 55 samples of fresh fruit were examined in the County Laboratory, of these 32 were submitted by the County Sampling Officers and 23 by Autonomous Food and Drugs Authorities. The samples consisted of the following varieties of fruit : 21 Apples, 4 Pears, 1 Peaches, 15 Oranges, 5 Grapefruit, 8 Lemons and 1 Tangerine. Three samples were reported upon adversely ; these consisted of one sample of Lemons submitted by a County Sampling Officer and two samples of Apples submitted by Autonomous Authorities. Sample No. S.2196 consisted of lemons in plain wrappers and some in printed wrappers. The lemons in the printed wrappers contained 140 parts per million of diphenyl, *i.e.*, 40 parts per million in excess of the maximum permitted limit. A further sample, from the same country of origin as sample No. S.2196 was, however, found to be satisfactory. A sample of Apples submitted by an Autonomous Authority was found to contain lead 6 parts per million and arsenic (as As) 1.4 parts per million. The Importers, Port Health Authority and Ministry of Agriculture, Fisheries and Food were notified and the remainder of the stock cleansed and offered for sale through the normal channels. The remaining sample of Apples, also submitted by an Autonomous Authority, was found to contain lead 4.4 parts per million and arsenic (as As) 1.7 parts per million. After washing in the laboratory

the lead was found to be 0·9 part per million and arsenic 0·18 part per million. The importers were communicated with and the remainder of the stock returned to them for cleansing.

THE FLOUR (COMPOSITION) REGULATIONS, 1956.

It will be remembered that the Flour Order, 1953, ended the control of flour mills but it stipulated that, with the exception of (1) flour containing the whole of the products derived from the milling of wheat or (2) flour which is the subject of a licence granted by the Minister of Food, all other flours must contain certain compulsory additions. It was obligatory to add to all flour (with the two exceptions noted above) *Creta Praeparata*, of British Pharmacopoeia or British Pharmaceutical Codex quality and of a prescribed fineness, to the extent of 14 ounces per 280 lbs. flour, *i.e.*, at the same rate at which this substance was incorporated in National flour. In addition to the above, other substances were to be restored to flours of an extraction rate less than 80 per cent., *i.e.*, to white flours of an extraction rate less than that of National flour. These new ingredients were Iron, Vitamin B₁ and Nicotinic acid and they had to be added in sufficient quantity to ensure total minimum contents of 1·65, 0·24 and 1·60 milligrammes respectively per 100 grammes of the flour. The three important nutrients mentioned are present naturally to the recommended amounts in flour of 80 per cent. extraction but when the extraction rate is reduced below 80 per cent., to give a whiter flour, the content of these nutrients is also reduced; they must, therefore, be restored artificially if the nutritional value of the flour is to be unimpaired. The Flour Order was enforced centrally by the Ministry of Food but Food and Drugs Authorities were requested to refer to the Ministry details of any samples which did not conform with the requirements indicated above. An amendment to the Labelling of Food Order which came into operation on the 1st January, 1954, permits flour to be sold without a declaration on the label of the compulsory additions which, under the Flour Order, were required to be present.

The Flour Order, 1953, was revoked on the 30th September, 1956, when the bread subsidy was abolished. On the same day, however, the Flour (Composition) Regulations came into operation and these have the effect of re-enacting with certain modifications the requirements as to composition contained in the previous Order and they make Food and Drugs Authorities responsible for the enforcement of the Regulations. Apart from certain specified exceptions, all flour (except flour containing the whole of the products derived from the milling of wheat) must now contain *Creta Praeparata* of a specified fineness in an amount between 235 to 390 milligrammes per 100 grammes of flour. In addition, all flour is

also required to contain the three other nutrients in the amounts previously prescribed, *i.e.*, Iron not less than 1.65 milligrammes per 100 grammes, Vitamin B₁ not less than 0.24 milligrammes per 100 grammes and Nicotinic acid or Nicotinamide not less than 1.60 milligrammes per 100 grammes. These nutrients must be added (when addition is necessary) in the case of Iron as reduced Iron or ferric ammonium citrate and, in the case of Vitamin B₁, Nicotinic acid and Nicotinamide, in a form conforming to the standards of the B.P. or B.P.C. The Regulations implement the Government's decision to accept the main conclusions in the report of the Panel on the Composition and Nutritive Value of Flour which was published on the 17th May, 1956, but they only cover the points which have been enumerated above ; further Regulations may ultimately be considered necessary. With this in mind the Ministry of Agriculture, Fisheries and Food together with the Ministry of Health and the Department of Health for Scotland published a Press notice on the 7th August, 1956, in which they stated that the Food Standards Committee had been invited to give consideration to other aspects of the composition of both flour and bread.

During the year under review 40 samples of plain flour (31 County) were submitted for examination. In addition, 44 samples of self-raising flour (36 County and eight from Autonomous Authorities) were also examined.

Of the 40 samples of flour, eight samples (six County) were reported upon adversely ; five were deficient in Creta Praeparata ; one was deficient in Vitamin B₁ and Nicotinic Acid ; one was deficient in Nicotinic Acid and one claimed vitamins without declaring the nature and amount of the vitamins present. Sample No. E.890, contained only 157 milligrammes of Creta Praeparata per 100 grammes of flour. The millers were communicated with and agreed to increase the feeding-in rate of Creta Praeparata. Samples No's S.1968 and S.2273, both from the same millers, were found to contain only 27 milligrammes and 127 milligrammes of Creta Praeparata per 100 grammes of flour respectively. The millers explained that the correct amount of Creta Praeparata was added to all their flour but that, owing to mixing difficulties, it was not always possible to ensure an even distribution. They gave an assurance, however, that every endeavour would be made to obtain the correct mixing in future. Sample No. N.9847 was found to contain only 0.22 milligramme of Vitamin B₁ and only 1.34 milligrammes of Nicotinic Acid per 100 grammes of flour and sample No. N.9848 was found to contain only 1.34 milligrammes of Nicotinic Acid per 100 grammes of flour. Both these samples were from the same millers who gave an assurance that steps would be taken to ensure that the required amounts of vitamins would be present in future. Sample No. E.1480, Wholewheat Flour, claimed the presence of vitamins on the label without declaring the nature and amount of the

vitamins present. The packers agreed to amend their label. The two samples submitted by an Autonomous Authority were both from the same millers and contained only 126 milligrammes and 220 milligrammes of Creta Praeparata per 100 grammes of flour respectively. The millers were communicated with and a further sample was found to be satisfactory.

Self-raising flour is required under the Food Standards (Self-Raising Flour) Order, 1946, to yield not less than 0.40 per cent. of available carbon dioxide and it is interesting to note that the 44 samples examined during the year 1958 all complied with this standard.

Details of all the County samples reported upon adversely will be found in table 25.

TINCTURE OF IODINE.

Weak solution of Iodine or, as it is usually called, tincture of Iodine is the preparation of Iodine commonly used as an emergency antiseptic for application to small wounds. The present limits for this preparation laid down in the British Pharmacopoeia, 1958, and those previously specified in earlier editions of the British Pharmacopoeia are compared below :—

	B.P. 1958.	B.P. 1948 and B.P. 1953.	B.P. 1932.
Iodine 	2.4—2.7% w/v	2.45—2.55% w/v	2.45—2.55% w/v
Potassium Iodide ...	2.4—2.7% w/v	2.45—2.55% w/v	1.45—1.55% w/v
Alcohol 	83—88% v/v	85—88% v/v	85—88% v/v

It should be noted that the B.P. 1958, became official from 1st September, 1958, so that limits applicable to the B.P. 1953 would obtain to samples submitted prior to that month. In addition to the above preparation the British Pharmacopoeia, 1958, includes a strong solution of Iodine with 10 per cent. of Iodine and also an aqueous solution of Iodine containing 5 per cent. of Iodine. Tincture of Iodine is made up with ethyl alcohol and purified water but industrial methylated spirits (acetone free) can be used in the preparation of iodine paint intended for external use only subject to the observance of conditions laid down by the Board of Customs and Excise.

During the year under review 29 samples of Tincture of Iodine, all informal, were examined in the County Laboratory. All the samples were submitted by County Sampling Officers. Of the total number examined, seven samples were reported upon adversely and details of these will be found in table 25. One of the samples showed only slight

discrepancies from the B.P. limits and no action was advised. Sample No. E.513 contained Iodine 0.29 per cent. and potassium iodide 0.21 per cent. below minimum B.P. limits respectively. The sample had the appearance of old stock. The vendor was interviewed and the remainder of the stock withdrawn from sale. Sample No. E.584 contained Iodine 0.22 per cent. in excess of the maximum B.P. limit. The vendor was communicated with and the remainder of the stock destroyed. Sample No. S.863 contained Iodine and potassium iodide each 0.14 per cent. in excess of the maximum B.P. limit. This was found to be old stock and no further stock was available. Sample No. E.1453, which was labelled Tincture of Iodine B.P. 1932, was found to contain 2.65 per cent. Iodine and 2.70 per cent. potassium iodide. This sample was submitted for analysis at the beginning of July, *i.e.* when the B.P. 1953 standards were operative. The sample would have just complied with the wider limits of the B.P. 1958 which came into operation two months later. The packers were communicated with and they agreed to alter the label and withdraw all incorrectly labelled bottles. Sample E.2325 contained potassium iodide 0.13 per cent. in excess of the maximum B.P. limit. The suppliers were communicated with and it would appear that the Tincture of Iodine was delivered to the retail chemist in a stock bottle and he rebottled it in small bottles for sale. There was a possibility that alcohol had been lost during storage and in transference from one container to another. The suppliers also expressed the opinion that the loss of alcohol might have been accelerated during the warm summer months through an imperfectly tightened screw cap on the bottle. Sample No. E.2358 consisted of a one ounce bottle containing only 22 mls. It was found to contain 0.85 per cent. iodine and 0.77 per cent. potassium iodide in excess of the maximum B.P. limits. The vendor was interviewed and remaining stocks examined for evaporation.

It will be of interest to note that six of the total of seven unsatisfactory samples showed figures for iodine or potassium iodide or both in excess of the B.P. limits. Only one sample showed a deficiency in iodine and potassium iodide content. It is probable that the majority of the samples showing an excess of iodine or potassium iodide owed this to concentration due to evaporation of alcohol rather than to incorrect formulation or dispensing. Evaporation from imperfectly sealed screw capped prepacked small bottles with capacities of one fluid ounce or less is particularly liable to affect the composition of the contents. Much of the Tincture of Iodine sold retail is prepacked in small bottles and may be stored in shops for some considerable time. It is probable that considerations of this kind have been responsible for the relaxation of the limits (particularly the maximum limits), for Tincture of Iodine given in the current B.P. and quoted in the above table.

SAMPLES CONTAINING EXTRANEOUS MATTER.

During the year under review 58 food and drug samples (41 County and 17 from Autonomous Authorities) were reported upon adversely because they were found upon examination to contain extraneous matter. The corresponding number for the year 1957 was 30 samples. In addition, during the year under review a further 10 samples, found to contain extraneous matter, were submitted under the heading of Miscellaneous samples and are mentioned in Part V of this report. The types of extraneous matter found in the food and drugs samples included :— mineral oil, carbonised matter, a pin, tobacco cigarette, crystals of struvite, fungus, cardboard, rust or iron oxide, piece of cotton cloth, mouse excreta, bovine skin and hair in corned beef, goat or sheep dung, fragment of plastic material, cotton fibres, jute fibres, broken glass, sulphuretted hydrogen from composition stopper, metal rivet, clinker and cement. Of the 41 County samples six were samples of milk and these are mentioned in the section of this report dealing with the types of milk adulteration. Brief details of all the remaining County samples are given in table 25 while the samples which were the subject of prosecutions are mentioned below.

Part of a Sliced Loaf, Sample No. S.1415.

This sample which was submitted as the result of a complaint consisted of one end crust and nine slices of a white loaf. Upon examination, approximately three-quarters of a used tobacco cigarette was found firmly embedded diagonally in the crumb of two of the slices and had been cut with the bread. Legal proceedings were instituted against the bakery concerned and a fine of £10 together with £7 costs was imposed.

Portion of Sultana Batch Cake, Sample No. S.9607.

This complaint sample consisted of five slices of “buttered” cake which appeared to have originally formed the greater part of one cake. Upon examination three pieces of foreign matter, weighing in all 1·0 gramme, were found embedded in two adjacent slices and they had been cut through and exposed on slicing the cake. The foreign matter was found to consist of the dung of an herbivorous animal, probably a goat or sheep. The sultana content of the cake was approximately 27 per cent. and the dung had almost certainly been originally present in the sultanas. The bakers were prosecuted and at the hearing of the summons they pleaded “guilty” and were fined £10 together with £8 14s. 6d. costs.

Rice, Sample No. S.9611.

This complaint sample of prepacked rice submitted in an opened carton was found upon examination to contain fragments of mouse excreta weighing in all 25 milligrammes. Legal proceedings were instituted against the vendor who eventually pleaded "guilty" but who was given an absolute discharge on payment of £2 13s. 11d. costs.

Swiss Roll, Sample No. E.753.

This complaint sample consisted of an opened carton containing five whole individual size chocolate swiss rolls together with part of another similar cake and a torn piece of cotton cloth. The cloth measured approximately 3½-in. by 1¼-in. and consisted of loosely woven material similar to a stockinette dish cloth. The cloth was found to be impregnated with the white filling material of the cake and with chocolate coloured cake crumb. Furthermore, it fitted into a cavity in the broken end of the part cake submitted. Legal proceedings were instituted and the bakers concerned pleaded "guilty" and were fined £5 together with £4 18s. costs.

Bread, Samples No. E.755 and E.756.

Both these samples consisted of pieces of white bread from one bakery which were submitted on complaint that they contained foreign matter. Upon examination, sample No. E.755 was found to contain three pellets of mouse excreta embedded in the crumb of the bread and sample No. E.756 contained two pellets of mouse excreta. In both instances, your Analyst was of the opinion that the mouse excreta had been present in the bread before it was baked. Legal proceedings were instituted and the defendants were fined £8 and £3 10s. costs.

Ginger Biscuits, Sample No. E.766.

This complaint sample consisted of a part carton of biscuits together with two fragments of broken glass stated to have been present in another biscuit from the same carton. The remaining biscuits were examined and found to contain further pieces of broken glass. In all, including the two fragments of glass submitted separately, 0.788 gramme of broken glass was present in the sample. The largest fragment found in a biscuit weighed 0.594 gramme and it had a fine wire 7.5 millimetres long sealed into it. The metal of the wire was composed of iron, nickel and copper. Part of the broken glass had originally formed part of a glass tube with an

internal diameter of approximately three-eighths of an inch, while the part of the glass containing the wire was from a solid piece. The above findings and the physical characteristics of the glass were consistent with it having originally formed part of the glass interior of an electric lamp bulb. Legal proceedings were instituted and the defendant company entered a plea of " guilty " and was fined £25 together with £7 costs.

In addition to the above, successful legal proceedings were instituted by the County in respect of a milk sample which contained visible dirt of the nature of dung. This sample is reported in table 11 and on page 36.

Successful legal proceedings were also instituted by the Autonomous Food and Drugs Authorities concerned in respect of the following samples :—Bread containing an aluminium rivet ; a portion of a meat pie containing mouse excreta ; a bread-finger ham sandwich containing mouse excreta and milk containing clinker.

SAMPLES CONTAINING INSECTS OR INSECT REMAINS.

Twenty food and drugs samples (11 County) came under the above heading during the year under review. In addition, one sample, submitted as a miscellaneous sample by a County Sampling Officer, and mentioned in Part V of this report was also found to contain insects. Three of the County samples and three of the samples submitted by Autonomous Authorities were the subject of prosecutions. Details of the County samples are given below.

In several instances I am indebted to Dr. W. H. Hinks, of the Natural History Museum, University of Manchester, for valuable help in the identification of the insects.

Cherry Brandy, Sample No. N.8525.

This consisted of a Miniature bottle of imported Cherry Brandy which had been opened and which was the subject of a complaint. Upon examination the contents were found to contain seven dead flies including two blow-flies, a house-fly and a fruit-fly. The glass of the bottle was very dark green in colour and the presence of the flies could not readily be detected until the contents were poured out. The sample was submitted in January when flies are not usually found. Its alcohol content was equivalent to 15·7 per cent. proof spirit and its total solids were 33·8 per cent. by weight. A comparison sample of the same product contained 41·7 per cent. proof spirit and 28·5 per cent. total solids by weight. It is

obvious that the cherry brandy in the complaint sample had suffered considerable loss of alcohol by evaporation either before or after it had been bottled, which suggests that it had been exposed open to the atmosphere and insect contamination for some considerable time.

As it was not possible to say whether the contamination by insects had occurred before or after importation it was decided to caution both the importers and the vendor.

Meat and Potato Pies, Samples No's E.3746 and E.3747.

Both these samples were the subject of complaints within two days of one another by different people. Both pies had been made in the same bakery. Upon examination each pie was found to contain a dead house fly. The condition of the flies was consistent with them having been heated in the pies. Summonses were issued against the retail baker who pleaded guilty and was fined £5 and £7 10s. costs in each case (£25 in all).

Cake Mix, Sample No. E.752.

This opened packet of cake mix was submitted on complaint and it was found to contain one small live beetle (*Ptinus Tectus*). The contents of the packet were otherwise in good condition and there was no other evidence of insect infestation. *Ptinus Tectus* is cosmopolitan in distribution and is frequently found on premises where cereals and other food-stuffs are stored. It is quite probable that the beetle in question had only recently gained access to the packet. This matter was reported to the local Public Health Authority with a view to the stock at the shop being examined.

Portion of Pastry of a Pork Pie, Sample No. S.9602.

This sample submitted on complaint was found to contain embedded in it a dead cockroach. Legal proceedings were instituted against the baker who at the hearing of the summons pleaded guilty and was fined £5 and £8 2s. costs.

Bread, Samples Nos. E.754 and E.760.

These two samples of sliced bread from different bakeries were each submitted on complaint. The first sample was found to contain embedded in the crust of the bread a very small unidentified fly approximately 3 millimetres long; the second sample contained part of a small insect larva 7 millimetres long. In each instance the bakery concerned was communicated with and informed of the result of the examination.

Sauce, Sample No. S.9605.

This part bottle of a thick mixed fruit sauce was found upon examination to contain a dead cockroach. In view of the fact that this type of sauce is sieved, in order to remove seeds, fruit skins, etc., after the ingredients have been cooked together, it is probable that the cockroach had not gained access during actual manufacture but the manufacturers were cautioned and their premises inspected.

Fruit Tart, Sample No. E.764.

This sample, submitted on complaint, consisted of part of a small bilberry tart which was found upon examination to contain, in the fruit filling, the thorax and abdomen of a beetle. The insect was a moorland dung beetle which feeds on sheep dung and it had probably got into the bilberries when they were being collected. This beetle is not a pest associated with stored food. It is practically the same colour as bilberries although larger than an individual bilberry. On enquiry, it transpired that the bilberries were imported and that it is by no means uncommon find an occasional beetle of this type present. It is difficult to be sure of finding every beetle because of the similarity in colour of the fruit. Both the bakers and the importers of the fruit were communicated with and cautioned.

Dried Peas, Sample No. S.2898.

This informal sample of one pound of dried peas was found upon examination to contain two small live grubs. The remaining small stock at the shop was examined by the local Public Health Inspector and was surrendered for destruction.

Rice, Sample No. C.821.

This informal sample of one pound of rice was found upon examination to contain two live and one dead weevils (*Calandra Granaria*). In this instance also the stock was examined and withdrawn from sale.

The nine samples submitted by Autonomous Food and Drugs Authorities were as follows :—Dates (one small live grub); Portion of Fish and Chips (dead cockroach); Pork Pie (one dead house-fly); Bread (one dead Broad-horned flour beetle, *Gnathocereus Cornutus*); Bread (one dead *Ichneumon* fly); Fried Fish in Batter (dead earwig); Fruit Malt Loaf (dead cockroach); Rolled Oats (infested with live mites (*Tyroglyphidae*) and Book Lice (*Psocidae*); Breakfast Flakes (live Book

Lice and insect excreta). Successful prosecutions were instituted by the Food and Drugs Authorities concerned in respect of the pork pie, the fruit malt loaf and the rolled oats.

PROSECUTIONS.

When the adulteration of a sample is considered to be sufficiently serious, legal proceedings are instituted. Prosecution, however, is only one of the means of dealing with adulterated or otherwise unsatisfactory samples. A perusal of tables 11 and 25, which are concerned with the various types of milk adulteration and sophisticated samples other than milk, respectively, shows that many of the samples are only slightly adulterated. In the case of food and drug samples, other than milk, deterioration may be due to long storage or adulteration may be brought about by the action of some person other than the actual vendor. In these instances it is often considered appropriate to take less drastic action than legal proceedings. In the case of milk samples vendors are sometimes cautioned and subsequent samples then frequently prove to be genuine ; in other instances dairies are visited by the Sampling Officers in order to correct faulty dairy management which has given rise to unsatisfactory samples. In the case of other foods and drugs appropriate action may take the form of the surrender for destruction of the remainder of any unsatisfactory stocks, returning stocks to manufacturers or communicating with packers with regard to unsatisfactory labels, etc.

During the year a total of 405 County food and drugs samples were reported upon adversely and in respect of 27 of these prosecutions were instituted, 13 in respect of milk samples, one in respect of Channel Islands Milk, one in respect of fish paste, two in respect of ice-cream, seven in respect of samples containing extraneous matter and three in respect of samples containing insects or insect remains. There were 26 convictions or orders to pay costs and one dismissal although the analytical findings in this case was not questioned. The total fines and costs during the year amounted to £270 4s. 7d. In table 27 will be found similar information for the years 1912 to 1958 inclusive.

Table 27.
County Fines and Costs during the Years 1912-1958.

Year.	Number of Prosecutions.		Convicted or ordered to pay costs.	Dismissals, etc.	Fines and Costs.		
					£	s.	d.
1912-1935	...	1504	1302	202	6,239	1	7
1936	...	22	20	2	107	14	9
1937	...	39	36	3	165	1	0
1938	...	26	24	2	132	10	1
1939	...	19	18	1	100	11	6
1940	...	25	23	2	171	14	0
1941	...	84	79	5	824	13	2
1942	...	38	36	2	502	4	10
1943	...	54	49	5	375	10	11
1944	...	38	37	1	291	19	6
1945	...	33	33	0	365	4	6
1946	...	94	92	2	936	7	9
1947	...	98	93	5	667	7	0
1948	...	70	69	1	703	0	6
1949	...	48	45	3	518	17	2
1950	...	43	42	1	405	8	7
1951	...	50	39	11	362	11	6
1952	...	65	64	1	620	13	0
1953	...	54	53	1	576	12	8
1954	...	45	45	0	294	9	6
1955	...	42	41	1	261	7	6
1956	...	20	19	1	185	13	6
1957	...	21	18	3	371	1	0*
1958	...	27	26	1	270	4	7
Total	...	2,559	2,303	256	15,450	0	1

*Includes £105 costs ordered by the Divisional Court resulting from an appeal by way of case stated in respect of Sample No. M.7500 and a fine of £2 and £7 costs on the case being referred back to the Magistrates Court. The case was first heard on the 9th December, 1957, and referred back for conviction on the 30th June, 1958.

Table 28.

Prosecutions arising out of Samples purchased during the year 1958.

District.	Number of Prosecutions.	Convicted or ordered to pay Costs.	Dismissals, etc.	Fines and Costs.		
				£	s.	d.
Adlington U.D.C.	1	1	...	9	18	0
Audenshaw U.D.C.	1	1	...	12	10	0
Bacup Borough	1	1	...	2	3	0
Denton U.D.C.	1	1	...	12	10	0
Droylsden U.D.C.	1	1	...	17	0	0
Farnworth Borough	1	1	...	9	18	0
Fulwood U.D.C.	1	...	1	...		
Haslingden Borough	1	1	...	9	18	0
Kirkby U.D.C.	2	2	...	21	8	5
Lancaster R.D.C.	1	1	...	7	18	0
Ormskirk U.D.C.	1	1	...	13	2	0
Orrell U.D.C.	1	1	...	17	0	0
Preston R.D.C.	2	2	...	18	15	0
Prestwich Borough	1	1	...	32	0	0
Ramsbottom U.D.C.... ..	1	1	...	9	18	0
Rawtenstall Borough	2	2	...	11	10	0
Standish U.D.C.	1	1	...	17	0	0
Westhoughton U.D.C.	1	1	...	23	16	2
Worsley U.D.C.	6	6	...	24	0	0
County Districts	27	26	1	270	4	7
Autonomous Authorities	7	7	...	151	18	0
Total—All sources	34	33	1	422	2	7

PART II.—THE MILK (SPECIAL DESIGNATION)
(PASTEURISED AND STERILISED MILK)
REGULATIONS, 1949 TO 1953.

*Phosphatase Test, Half-hour Methylene Blue Test and
Turbidity Test.*

The above Regulations applying to heat-treated milk (as distinct from other Regulations relating to raw milk) were made jointly by the Minister of Health and the Minister of Food. The Regulations, besides relating to pasteurised milk, also provide for the special designation “sterilised milk.”

The special designations for heat-treated milk are “Pasteurised” and “Sterilised” but in appropriate circumstances the designations “Tuberculin Tested Milk (Pasteurised)” and “Tuberculin Tested Milk (Sterilised)” may also be used.

Food and Drugs Authorities are responsible for the granting of pasteurising and sterilising licences but Local Authorities are responsible for all other licences required by the Regulations. The duties of Food and Drugs Authorities include the inspection of records, the inspection of the arrangements for processing milk and the taking of samples in respect of all plants for which licences have been granted.

An amendment to the Milk (Special Designation) (Pasteurised and Sterilised Milk) Regulations which came into operation on the 20th December, 1953, required the compulsory use of overlapping caps on all containers of pasteurised milk from the 1st October, 1954. This same date was fixed in the principal Regulations for the operation of the requirement that pasteurised milk must be put into the containers in which it is to be delivered to customers on the premises at which it has been pasteurised. It follows that the bottling of pasteurised milk from churns by retailers and the sale of pasteurised milk by measure from a can are now both illegal. The amending Order also permits sterilised milk to be processed in cans and other containers of a capacity of not more than one gallon as well as in bottles.

Pasteurised milk must be treated by one or the other of the following processes :—

- (a) Retained at a temperature of not less than 145°F. and not more than 150°F. for at least 30 minutes and be immediately cooled to a temperature of not more than 50°F.; or

(b) Retained at a temperature of not less than 161°F. for at least 15 seconds and be immediately cooled to a temperature of not more than 50°F. ; or

(c) Retained at such temperature for such period as may be specified by the licensing authority with the approval of the Minister.

Sterilised milk must be filtered or clarified, homogenised and heated to and maintained at such a temperature, not less than 212°F., for such a period as to ensure that it will comply with the turbidity test prescribed.

The Regulations state that samples may be taken at any time while the milk is in the possession of the processor or of the licensed dealer. Unopened bottles should be taken as samples where possible but where the milk is in bulk (exceeding 1 quart) it may be sampled into sterile bottles. All samples must be carried in insulated containers (not artificially cooled) and they must arrive at the laboratory on the day of sampling.

Three tests are prescribed, a phosphatase test and half-hour methylene blue test for pasteurised milk and a turbidity test for sterilised milk. Samples intended for examination by the phosphatase test must be stored in the laboratory at a temperature of between 32°F and 40°F while samples intended for the methylene blue test must be stored at the laboratory at an atmospheric shade temperature not exceeding 65°F. No storage temperature is prescribed for samples of sterilised milk.

The statutory phosphatase test depends on the liberation of free phenol from the salt disodium phenyl phosphate by the enzyme phosphatase. This enzyme is always present in raw milk but is almost entirely destroyed by the amount of heat-treatment necessary for efficient pasteurisation, *i.e.*, necessary for the destruction of *m.*-Tuberculosis and other pathogenic micro-organisms. The amount of phenol liberated in the test is an approximate but not directly proportionate measure of the phosphatase remaining in the milk ; a high result indicating insufficient heat-treatment or the presence of raw milk. The test is extremely delicate and it is essential that great care be exercised in collecting the samples for submission to the test, in testing the purity of the reagents used and in the actual carrying out of the test.

The methylene blue test depends on the decolourisation of methylene blue by bacteria and reducing substances present in milk. If under the conditions of the test, decolourisation occurs in less than 30 minutes it is deemed that there has been such a development of bacteria and reducing substances in the milk as to render its keeping quality unsatisfactory.

The test is designed to ensure that milk will keep fresh, if kept reasonably cool, until the next day's supply is received by the consumer and with that end in view samples, before examination in the laboratory, are not kept in a refrigerator but are merely kept at atmospheric shade temperature not exceeding 65°F. It should be noted that the half-hour methylene blue test prescribed by these Regulations is quite different from the methylene blue test prescribed in the Milk (Special Designation) (Raw Milk) Regulations, 1949, in relation to raw designated milks.

The turbidity test for sterilised milk is based upon the fact that heating to not less than 212°F for a period sufficient for effective sterilisation will also completely denature all the soluble protein of the milk. Samples which show the presence of soluble protein under the conditions of the test are insufficiently heated or contain raw milk.

The Milk (Special Designations) (Specified Areas) Orders 1952 to 1958.

Following the publication of a government memorandum on Measures to Improve the Quality of the Nations Milk Supply the Minister of Food was given power under Regulation 55 G of the Defence (General) Regulations, dated 20th January, 1944, to restrict the sale of raw milk within any area which had been specified for that purpose in an Order made by the Minister. Before an area could be made a specified area it was, of course, necessary for the Minister to satisfy himself that adequate plant was available for heat-treating the whole of the milk sold within the area, with the exception of Tuberculin Tested Milk. Similar provisions to the above were included in the Milk (Special Designations) Act, 1949, and Regulation 55 G was then revoked. This Act was, in turn, repealed and replaced by the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950, which came into operation on the 1st January, 1951, and which also consolidated certain other enactments. Section 19 of this Act made it compulsory to use a special designation in respect of all sales of milk by retail for human consumption in an area which has been designated by Order as a Specified Area. The only exceptions refer to certain catering sales and to the sale of milk by a producer to his employees, if, in the latter instance, he does not engage in any other selling of milk by retail. Section 23 of the same Act empowered the Minister of Food to bring into operation by Order the provisions of Section 19 in any area. The special designations which may be used in relation to heat-treated milk in a Specified Area are "Pasteurised," "Sterilised," "Tuberculin Tested Milk (Pasteurised)" and "Tuberculin Tested Milk (Sterilised)." In relation to raw milk the only special designation now permitted is "Tuberculin Tested." The use

of the special designation "Accredited" has been prohibited in specified areas since 1st October, 1954, by Section 22 of the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950. The Milk (Special Designation) (Raw Milk) Regulations, 1949, also prohibited the granting of Producer's licences to use the special designation "Accredited" after 30th September, 1952.

The preceding paragraph describes the position as regards the making of Specified Areas up to and including the early months of the year 1955 but, due to the making of two Transfer of Functions Orders in the year 1955 and the passing of the Food and Drugs Act, 1955, certain alterations in the law, particularly as to procedure, have since become operative. When the Ministry of Food was dissolved on the 7th April, 1955, the function of the Minister of Food to make Milk (Special Designations) (Specified Areas) Orders was transferred to the Minister of Agriculture, Fisheries and Food and this function was again transferred on the 6th July, 1955, to the Minister of Agriculture, Fisheries and Food and the Minister of Health acting jointly following the making of the Transfer of Functions (Food and Drugs) Order, 1955. Due to the coming into operation of the Food and Drugs Act, 1955, on the 1st January, 1956, Sections 19, 22 and 23 of the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950 (which related to the compulsory use of special designations in Specified Areas, the abolition of the special designation "Accredited" and the function of the Ministers to make Milk (Special Designations) (Specified Areas) Orders) have now been replaced by Sections 37, 40 and 41 respectively of the 1955 Act.

The first Milk (Special Designations) (Specified Areas) Order which affected part of the area of the County Food and Drugs Authority came into operation on the 1st November, 1952. Seven other Orders similarly affecting parts of the County came into operation on the 1st January, 1954, the 1st October, 1954, the 6th December, 1955, the 10th April, 1956, the 25th November, 1957, the 14th April, 1958 and the 1st October, 1958, respectively. By the end of the year 1958, a total of 80 of the 93 County districts in the County Food and Drugs area had become specified areas. In view of the fact that it is the duty of the Food and Drugs Authority to enforce the provisions of Section 37 of the Food and Drugs Act, 1955, it follows from the above that an increased number of samples of special designation heat-treated milks are now being taken by County Sampling Officers in the County districts concerned for submission to the County Laboratory for examination by the statutory Phosphatase, Half-hour Methylene Blue or Turbidity tests.

During the year, 1,316 samples of milk were submitted for examination by the Phosphatase test and the Half-hour Methylene Blue test or by the Turbidity test. The samples were marked either Pasteurised,

Tuberculin Tested (Pasteurised) or Sterilised and tables 29, 30 and 31 give particulars of the results obtained. In addition, one control sample of raw milk was submitted for examination by the Phosphatase Test and the Half-hour Methylene Blue test and, as was to be expected, this sample did not pass the Phosphatase test. Of the six County samples which failed the Phosphatase test, three were stated to have been taken at pasteurising plants and three were obtained in specified areas. The one sample that failed the Half-hour Methylene Blue test was taken in a specified area. This is not surprising in that it is hardly to be expected that freshly pasteurised milk, taken at a processing plant, would fail the Half-hour Methylene Blue test. There is obviously more possibility of older milk, of poorer keeping quality, being obtained from roundsmen than from the processing plants.

With regard to the methylene blue test the Regulations prescribe that it shall be commenced between 9 a.m. and 10 a.m. on the day after the sample was taken and that in the meantime, as already indicated, it shall be kept at the laboratory at atmospheric shade temperature not exceeding 65°F (the sample must not be kept in a refrigerator). During periods of exceptionally warm weather the shade temperature often exceeds the limit specified. In addition to the numbers reported as unsatisfactory, 12 samples submitted by County Sampling Officers and two samples from an Autonomous Authority also decolourised methylene blue, but these were, however, stored due to abnormally hot weather conditions at atmospheric shade temperatures which exceeded 65°F, and the tests were therefore void. It should be mentioned, however, that even when the shade temperature exceeds 65°F, a high proportion of the samples still pass the test; in view of the fact that keeping quality is particularly desirable in warm weather it is unfortunate that the statutory test cannot then be applied. With regard to the turbidity test it will be observed from table 31 that none of the samples of sterilised milk failed to pass the test.

Table 29.
Phosphatase Tests, 1958.

Type of Milk.	Number Submitted.		Number Unsatisfactory.					
			County.			Borough.		
	County.	Borough.	Group II.	Group III.	Total	Group II.	Group III.	Total.
Pasteurised ..	621	64	0	3	3	1	0	1
T.T. (Pasteurised)	379	65	2	1	3	0	0	0
Raw	1	0	0	0	0	0	0	0
Totals	1,001	129	2	4	6	1	0	1

Table 30.
Half-hour Methylene Blue Tests, 1958.

Type of Milk.	Number Submitted.		Number Unsatisfactory.	
	County.	Borough.	County.	Borough.
Pasteurised	621	64	0	0
T.T. (Pasteurised) ..	377	65	1	0
Raw	1	0	0	0
Totals	999	129	1	0

Table 31.
Turbidity Tests, 1958.

Type of Milk.	Number Submitted.		Number Unsatisfactory.	
	County.	Borough.	County.	Borough.
Sterilised	145	42	0	0
T.T. (Sterilised) ..	0	0	0	0
Totals	145	42	0	0

PART III.—THE FERTILISERS AND FEEDING STUFFS ACT, 1926.

The Fertilisers and Feeding Stuffs Act, 1926, came into force on July 1st, 1928. It is intended to safeguard the purchasers of substances used for the fertilisation of the soil and for the feeding of cattle and poultry.

The general purpose of the Act, like that of the Act of 1906, which it repealed, is to provide civil remedies for the misdescription of, and to prevent fraud in, fertilisers and feeding stuffs. Its scope is defined by Regulations made by the Minister of Agriculture, Fisheries and Food.

In addition, during and since the war, a number of Regulations governing the control and composition of fertilisers and feeding stuffs were made by appropriate Government Departments. In the year 1953, however, the Minister of Food made the Feeding Stuffs (Revocation) Order which came into operation on the 1st August, 1953. The effect of this Order was to revoke all Orders made under the Defence (General) Regulations, 1939, which were concerned with the control of the manufacture, licensing, rationing and prices of Feeding Stuffs. The only statutory control of the composition of Feeding Stuffs now in operation is, therefore, that exercised under the Fertilisers and Feeding Stuffs Act, 1926.

The one exception to the above is that during the years 1953, 1954 and 1958, in exercise of powers first conferred by Section 2 of the Therapeutic Substances (Prevention of Misuse) Act, 1953, now replaced by Section 5 of the Therapeutic Substances Act, 1956, Regulations were made by the Minister of Health which permit the use of certain antibiotics, *viz.*, penicillin, aureomycin, streptomycin and oxytetracycline, in pig foods and poultry foods and for horticultural purposes. These Regulations prescribe conditions with regard to labelling and also specify in regard to pig and poultry foods maximum limits for the amounts of the prescribed antibiotics which may be present.

It has already been mentioned that the scope of the Fertilisers and Feeding Stuffs Act is defined by Regulations. The Regulations operative prior to the year 1956 were the Fertilisers and Feeding Stuffs Regulations, 1932, to which minor amendments had been made in the years 1942 and 1951. In November, 1955, however, the Minister of Agriculture, Fisheries and Food made the Fertilisers and Feeding Stuffs Regulations, 1955, which came into operation on the 1st January, 1956. The new Regulations follow, in general, the form of the 1932 Regulations although they have been completely re-drafted and include amendments recommended by the Standing Advisory Committee. Some of these amendments are concerned with changes in methods of analysis but the Standing Advisory Committee is still engaged in carrying out a general review of the prescribed methods and it is expected that from time to time amending Regulations will be made to give effect to the Committee's recommendations. The first of these amending Regulations was made on the 21st November, 1956, and came into operation on the 1st January, 1957. It provides for an alternative method of determining phosphoric acid in fertilisers and feeding stuffs.

Forty-nine samples have been examined for the County during the year under review. The number of County samples, therefore, has been maintained at the level reached over the previous nine years. Of these, 25 were fertilisers and 24 consisted of feeding stuffs. The fertilisers comprised 22 formal samples and three informal samples. The feeding stuffs comprised 23 formal samples and one informal sample.

In addition 37 samples (eight formal and 29 informal) were examined for Autonomous Authorities. Of these 25 samples (all informal) were fertilisers and 12 (eight formal and four informal) consisted of feeding stuffs.

Of the 25 samples of fertilisers examined for the County 23 were found upon analysis to be correct within the limits of variation permitted by Regulations made under the Act and two showed minor deviations

outside the permitted limits of variation. Three samples of fertilisers were however, reported upon with regard to their statutory statements and these are referred to below.

With regard to the 24 samples of feeding stuffs examined for the County, all were found to be correct within the permitted limits of variation.

In the case of informal sample No. 3/1/B, Hoof and Horn Meal, no Statutory Statement was available, neither was the package marked with the quantitative particulars required. Your Analyst was of opinion that the sample conformed to the definition of Hoofs and Horns contained in the second column of the Fourth Schedule to the Fertilisers and Feeding Stuffs, Act, 1926, and that a Statutory Statement containing the amount of nitrogen present in the sample should, therefore, have been given with the article as required by Section 1 and Part 1 of the First Schedule of the Act. Enquiries revealed that the product had been supplied to the retailer without a Statutory Statement due to an omission on the part of the packer. In view of the packer stating that the particulars would be supplied in future, the Committee decided that a cautionary letter would be sufficient in this case.

Informal sample No. 3/9/B, Dried Blood, was purchased retail by an Inspector from a hardware store and submitted to the laboratory for analysis. The vendor did not supply a Statutory Statement neither was the packet marked with the prescribed particulars. The sample was found to conform with the definition of Dried Blood contained in the second column of the Fourth Schedule to the Fertilisers and Feeding Stuffs Act, 1926, and a Statutory Statement containing the amount of nitrogen present should, therefore, have been given with the article. It transpired that it was the practice of the manufacturers to pre-pack the Dried Blood in thin polythene bags to which were applied stick-on labels marked with the prescribed particulars. In addition, a further statement was made on the invoice sent to the retailer. Difficulty had been experienced with the use of stick-on labels when the bags were not stored under ideal conditions and the use of this type of label has now been discontinued. The retailer having been made aware of his responsibilities, no further action was taken.

The remaining sample No. 32/10/A, Base Fertiliser, complied with the definition of a compound fertiliser or mixed fertiliser contained in the second column of the Fourth Schedule to the Fertilisers and Feeding Stuffs Act, 1926. The declared particulars only included the percentages of Nitrogen and Potash present and these were found to be correct within the limits of variation. On examination for phosphoric acid, however, the amount of phosphoric acid insoluble in water was found to be 0.7 per cent., a figure which is slightly in excess of the permitted limit of variation,

viz. 0.5 per cent. The amount present should, therefore, have been contained in the copy of particulars indicated by a mark applied to the article. The manufacturers explained that phosphoric acid had not been added to the compound but that the latter contained organic material added as a filler. It was suggested that the phosphoric acid was derived from the filler used. As the amount of phosphoric acid insoluble in water was small and as this omission from the particulars was unlikely to be to the prejudice of the purchaser it was decided to take no further action in the matter.

Table 32.
Fertilisers.

Sample, Number, and Description.	Formal or Informal.	Per cent. Phosphoric Acid (P ₂ O ₅).												Other Figs per. cent.
		Per cent. Nitrogen.		Total.		Soluble		Insoluble.		Soluble in Citric Acid.		Per cent. Potash. K ₂ O.		
		G.	F.	G.	F.	G.	F.	G.	F.	G.	F.	G.	F.	
40/11/A Widnes— Lawn Sand ...	I	6.0	5.75											
41/11/A Widnes— Flower Fertiliser ...	F	7.0	7.15		7.6	6.5	6.9	0.5	0.7			10.5	10.75	
26/10/A Seaforth— Flower Manure ...	F	6.0	6.45		5.0	3.8	3.6	2.2	1.4			9.0	9.65	
27/10/A Seaforth— Tomato Top-Dressing	F	6.0	6.35		3.45	2.0	2.05	1.0	1.4			9.0	9.2	
42/11/A Widnes— Compound Fertiliser ...	F	9.0	8.1		9.65	8.25	8.9	0.75	0.75			15.0	14.3	
43/11/A Widnes— Compound Fertiliser ...	F		0.3		16.05	14.50	14.45	1.50	1.6			16.0	15.2	
11/12/A Warrington ½-in. to Dust Steamed Bone Meal ...	F	0.8	0.85	27.4	26.5									A
44/11/A Widnes— Flower Fertiliser ...	F	7.0	6.3		7.6	6.5	6.8	0.5	0.8			10.5	9.8	
45/11/A Widnes— Compound Fertiliser ...	F	9.0	8.8		7.6	6.5	6.6	0.5	1.0			7.0	6.4	
3/1/B Headquarters Hoof and Horn Meal ...	I		13.6											
46/11/A Widnes— “—” Special Aldrin Compound ...	F	10.0	9.4		9.35	9.25	8.95	0.75	0.4			18.0	18.0	

Table 32—continued.

Sample, Number, and Description.	Formal or Informal.	Per cent. Phosphoric Acid (P ₂ O ₅).												Other Figs per. cent.
		Per cent. Nitrogen.		Total.		Soluble		Insoluble.		Soluble in Citric Acid.		Per cent. Potash. K ₂ O.		
		G.	F.	G.	F.	G.	F.	G.	F.	G.	F.	G.	F.	
47/11/A Widnes— Compound Fertiliser ...	F	9·0	8·75		17·7	16·5	16·1	1·5	1·6					B
22/4/A Lower Blackburn— Sulphate of Ammonia ...	F	20·8	21·0											
48/11/A Widnes— Compound Fertiliser ...	F	6·0	6·1		14·6	13·75	13·4	1·25	1·2			15·0	13·6	
49/11/A Widnes— John Innes Base ...	F	(Or- ganic) 5·1	5·2 (Or- ganic) 5·1		7·7	7·2	6·9	0·5	0·8			9·7	10·5	
30/10/A Seaforth— Base Manure ...	F	5·5	5·7		5·1	3·2	2·9	2·65	2·2			6·0	6·7	
31/10/A Seaforth— Base Manure ...	F	5·5	5·4		5·2	3·2	3·0	2·66	2·2			12·0	12·6	C
3/9/B Manchester— Dried Blood ...	I		10·9											
1 Widnes— Compound Fertiliser ...	F	7·0	6·9		7·2	6·0	6·4	1·0	0·8			7·0	6·9	
50/11/A Widnes— Granular Superphos- phate ...	F					19·0	18·8							
32/10/A Seaforth— Base Fertiliser...	F	3·0	3·0		0·9		0·2		0·7			12·0	11·6	
33/10/A Seaforth— Top Dressing ...	F	13·0	12·45				0·25		0·25				Nil	D
24/4/A Lower Blackburn— Sulphate of Ammonia (Neutral Quality) ...	F	20·8	20·6											
2 Widnes— Compound Fertiliser ...	F	6·0	6·2		9·5	8·25	8·8	0·75	0·7			6·0	6·2	
3 Widnes— Bulb Fertiliser	F	6·5	6·6		6·3	5·5	5·5	0·5	0·8			9·0	9·2	

G.—Guaranteed.

F.—Found.

A.—Found, Amount that will pass through $\frac{1}{8}$ -in. sieve 99·5.B.—Guaranteed, Free Acid (H₂SO₄) 0·02 ; Found, Free Acid—Nil.

C.—Found, Moisture 13·2.

D.—Guaranteed, Free Acid (H₂SO₄) 0·02 ; Found, Free Acid (H₂SO₄) 0·01.

Table 33.

Feeding Stuffs.

Sample Number and Description.	Formal or Informal	Per cent. Oil.		Per cent. Protein.		Per cent. Fibre.		Other Figures, per cent.
		G.	F.	G.	F.	G.	F.	
9/12/A Warrington— Pig Fattening ...	F	2.5	2.2	14.0	14.9	6.0	4.5	
10/12/A Warrington— Sow and Weaners ...	F	2.5	2.8	16.5	15.8	6.0	4.9	
17/3/A Kirkham— Coarse Dairy Ration...	F	5.0	5.1	22.0	23.6	8.0	7.7	
18/3/A Kirkham— Calf Follow on Meal No. 2	F	5.5	5.2	21.0	21.0	7.0	4.8	
16/5/A Blackburn Higher— Pig Food No. 2 ...	F	2.8	2.6	14.9	15.3	6.3	5.6	
17/5/A Blackburn, Higher— Layers Mash ...	F	3.4	3.3	16.8	17.2	6.2	6.3	
12/12/A Warrington— Dairy Ration ...	F	4.5	3.8	22.0	21.95	8.0	5.7	
19/3/A Kirkham— Barley Meal ...	F				10.9		4.6	A
20/3/A Kirkham— Pea Meal ...	F				22.4		5.9	B
21/9/A Manchester— Coarse Dairy Meal ...	F	5.6	4.9	19.0	19.5	8.0	8.5	
22/9/A Manchester— Layers Mash A.V....	F	2.5	2.7	15.85	16.6	4.2	4.3	
28/10/A Seaforth— Battery Mash... ..	F	3.5	4.0	17.5	16.1	6.0	5.7	
29/10/A Seaforth— Pig Fattening Meal ...	F	3.0	3.4	13.0	12.9	6.0	5.0	
20/7/A Bury— Ground Oats ...	F		4.2		11.2		9.4	C
21/7/A Bury— Indian Meal ...	F						1.1	D

Table 33—continued.

Sample Number and Description.	Formal or Informal	Per cent. Oil.		Per cent. Protein.		Per cent. Fibre.		Other Figures, per cent.
		G.	F.	G.	F.	G.	F.	
23/4/A Lower Blackburn— Barley Meal ...	F				11.6		5.6	E
31/2/A Lonsdale— Barley Meal ...	F		2.1		11.8		5.3	H
32/2/A Lonsdale— Sussex Ground Oats ...	F		3.6		12.9		10.4	I
21/6/A Leyland— Intensive Layers Mash ...	F	5.0	4.3	18.0	17.2	5.0	5.3	
22/6/A Leyland— Sow and Weaner (Pig Meal No. 1) ...	F	3.5	3.4	16.5	16.3	5.5	5.2	
23/9/A Manchester— Barley Meal ...	F		1.7		8.75		4.3	J
24/9/A Manchester— Milk Nuts ...	I	6.0	5.9	21.0	21.9	6.5	7.2	
22/7/A Bury— Pig No. 1 ...	F	3.0	2.7	17.5	15.75	6.0	4.2	
23/7/A Bury— Int. Layers Meal ...	F	2.5	2.1	17.5	16.8	6.0	5.0	

A.—Found, Sand and Other Silicious Matter 0.5 and Ash 2.5.

B.—Found, Sand and Other Silicious Matter 0.4 and Ash 3.6.

C.—Found, Sand and Other Silicious Matter 1.5 and Ash 3.4.

D.—Found, Sand and Other Silicious Matter 0.1 and Ash 1.5.

E.—Found, Sand and Other Silicious Matter 0.62 and Ash 2.4.

H.—Found, Sand and Other Silicious Matter 0.5 and Ash 3.0.

I.—Found, Sand and Other Silicious Matter 1.3 and Ash 3.4.

J.—Found, Sand and Other Silicious Matter 0.5 and Ash 2.4.

PART IV.—WATERS, EFFLUENTS, ETC.

Potable Waters.

Fifty-eight samples of water have been examined during the year 1958 for suitability for drinking or domestic use. Of these, 24 came from dairies. All were submitted for full sanitary analysis, and are classified in the following table according to their source and organic purity.

Table 34.
Waters, 1958.

Source.	Fit.	Doubtful.	Unfit.	Total.
Deep Well 	6	3	0	9
Shallow Well 	0	1	1	2
Upland Surface 	14	12	0	26
Mixed Deep Well and Upland Surface 	2	2	0	4
Spring 	6	2	0	8
Miscellaneous 	6	0	3	9
Total 	34	20	4	58

Forty-one of the samples in the above table were taken from public supplies (9 deep well, 24 upland surface, 4 were mixed deep well and upland surface waters, 1 from a spring, and three from disused colliery workings). Nine of these contained traces of nitrite. This can result from chemical treatment of the water and from reduction of nitrates, as well as from pollution, but special consideration of the bacteriological findings was advised. Similar advice was given in the cases of two dairy waters with higher ammonia contents than normal, and in regard to a water of high vegetable content which was supplied direct from a reservoir to a house without receiving any treatment. High contents of vegetable matter were also found following complaints of colour and odour, in three waters taken from a village supplied with upland surface water. No evidence of animal pollution was found. Water lice and vegetable matter were the cause of another complaint about a public supply, but as the water was otherwise satisfactory, it was suggested that the main be flushed out. The waters derived from disused mine workings, submitted for quality control, appeared to be free from animal matter, but, in two instances, were being contaminated with an acidic water which rendered them unsuitable for domestic use. All other water samples from public supplies were satisfactory.

Twenty-six of the fifty-eight samples were submitted by the County Medical Officer of Health, and the others by the following Local Authorities : County Boroughs of Preston, 1 ; Southport, 4 ; Boroughs of Chorley, 3 ; Darwen, 6 ; Leigh, 1 ; Rawtenstall, 2 ; Urban Districts of Horwich, 1 ; Orrell, 2 ; Ramsbottom, 3 ; Walton-le-Dale, 2 ; Rural Districts of Lancaster, 1 ; Lunesdale, 3 ; West Lancs, 1 ; Wigan, 2.

Toxic Metals in Water.

Samples which had been in contact with lead, copper, or zinc, either in service pipes or during storage, were examined for the presence of these metals.

Thirty samples were examined for lead, and the results are summarised in table 35.

Table 35.

Lead parts per million.	None Detected.	Less than 0·3.	0·3 to 1·0.	4 to 5.
Number of samples ...	25	1	3	1

Four waters contained more than the usually accepted limit of 0·3 part per million. All were acidic waters taken from private supplies, and conveyed through lead pipes. The one sample which was very heavily contaminated with lead, was "first drawn" water which had been standing at least 24 hours in the pipes.

None of the 29 waters examined for copper contained a significant amount, the greatest quantity found being 0·3 parts per million. The usually accepted maximum limit for copper is 1·5 parts per million.

The usually accepted limit for zinc in water is five parts per million, but the highest quantity found in a water in 1958 was only 0·15 part per million, most of the waters tested for zinc were quite free from it.

Iron was found in 32 of the 40 samples tested for it, and 13 of these contained quantities in excess of the 0·4 part per million which is usually regarded as the limit above which complaints of turbidity or staining may arise. The results are summarised in table 36.

Table 36.

Iron parts per million.	None Detected.	Less than 0·4.	0·4 to 1·0.	1·1 to 5·0.	5·1 to 10·0.	More than 10·0.
Number of samples ...	8	19	8	3	1	1

The two waters with the very high contents of iron were the acid waters, mentioned earlier in this report, which were obtained from disused mine workings.

One water, taken from a ship, in connection with a complaint, was examined for Mercury, Arsenic and Antimony, in addition to the above metals, but these were not present.

Other Waters, Effluents, etc.

Thirty-seven samples were submitted under this heading.

Six effluents were examined for compliance with the recommended standards of purity made by the Royal Commission on Sewage Disposal, all in connection with the Mersey River Board Survey of Effluents. Three complied with the recommendations. Four of the six samples were taken at different times from one outfall as adjustments were made. Each sample showed an improvement upon the last until finally the effluent was found to be satisfactory.

Twenty-five samples of swimming bath and sea bathing lake water were examined for compliance with the Ministry of Health Recommendations (pH should exceed seven but should not exceed eight, and free chlorine should not be less than 0·2 part per million or much greater than 0·5 part per million). Where breakpoint chlorination is used, however, higher chlorine residuals are desirable ; also, at times of heavy bathing when there is an increase in the amount of ammonia in the water, it is wise to increase the chlorine to give an effective amount of free residual chlorine. Therefore, although 11 samples showed higher chlorine contents than the above recommendations advocate, the laboratory's advice was always tempered according to the conditions obtaining

in the baths. One water was low in chlorine, and it was also too alkaline. This was from an open air pool and algae had begun to make the water turbid. Another pool showed a low chlorine content at the outlet, although in other parts the water complied with the recommendations. One further bath was twice found to have become slightly acid.

The growing interest in the state of our coastal waters was reflected in six sea water samples taken after eels had been noticed to be in a condition atypical of their sea water phase of life. The salinity was found to be lower than ocean water, but at around 2.95 per cent. it was not abnormal for enclosed waters like the Irish Sea.

PART V.—RADIOACTIVITY.

The dangers of radioactivity have been appreciated for many years, but the need for adequate training and experience in radiological problems and health physics for appropriate personnel in the public services was brought to a head by the Windscale incident in October, 1957, and further emphasised by the report of the Fleck Committee in December of the same year. Peace time hazards, in addition to nuclear weapon tests, that may cause contamination of the atmosphere, food and water include explosions, leaks, fires and other accidents. In addition, the safe disposal of the vast quantities of radioactive wastes that are being created by the steadily increasing number of nuclear power generating stations is a very pressing problem. The usual cheap method of dilution in the sea cannot be used for isotopes of long half-life because of the property which algae and small marine organisms have of concentrating some of these products in their bodies and this may lead to the contamination, in turn, of the larger fish which use them as food. Radioactive isotopes are finding increasing use in hospitals, research laboratories and in many industrial processes and during the year under review alone, the Atomic Energy Authority sent out approximately 50,000 consignments of various radioactive isotopes. For the first time the current edition of the British Pharmacopoeia includes preparations of two radiocative compounds, *viz.* sodium radio-iodide and sodium radio-phosphate.

In the summer of the year under review, your Committee authorised the County Laboratory to obtain apparatus for detecting and determining beta and gamma radioactive contamination of food and water. This has now been set up and calibrated and in the last four months of the year, 44 samples were examined for radioactivity; these were made up as

follows :—Fresh Milk, 22 ; Condensed Milk, 1 ; Dried Milk, 1 ; Tinned Fish, 4 ; Upland Surface Mains Water, 5 ; Deep Well Water, 2 ; Rain Gauge Contents, 2 ; Vegetables, 5 ; Sheep Bones, 2 ; Routine testing of food and water has thus been started and will be carried on regularly with a view to building up information regarding the normal levels of activity for the various commodities. Any sudden increase above these levels would give warning of an unusual release of activity possibly outside this country.

The year 1958 has been a period of intensive testing of nuclear weapons by three of the Great Powers. Over 60 bombs of varying yield were exploded, the last two being on 1st and 2nd November last and were both in the 10 megaton range. When these nuclear weapons are exploded some 100 different radioactive isotopes are produced, many of these have a half-life measured in fractions of a second and are of no importance ; others have very long life-lives and the contamination of the surface of the world by these cannot be safely ignored. A nuclear explosion sends into the atmosphere fission products associated with extremely fine dust particles. The majority of these particles have diameters of less than $1/1000$ cm. and they stay airborne long enough to diffuse widely throughout the earth's atmosphere. With the original atomic bombs about half the dust was deposited in approximately 22 days, but with the more powerful hydrogen bombs the debris is sent very much higher, right into the stratosphere, with the result that only 10 to 20 per cent. is deposited annually. The more dangerous products which reach the ground again include : Strontium-90, Cerium-144, Caesium-137, Promethium-147, Ruthenium-106, Strontium-89 and Zirconium-96. The isotope Sr90 is considered the most dangerous since it behaves similarly to Calcium in the body and is concentrated in the bone structure. It forms quite an appreciable proportion of the fission products, has a long half-life (28 years) and the comparatively long " biological half-life " of about 7.5 years. The last mentioned property means that once Sr90 is absorbed into the body skeleton it will be 7.5 years before the activity has fallen to half the original value from a combination of its own decay and the body replacement mechanism. The amount of radioactive strontium in the human body is related to the Sr : Ca ratio in the diet. Furthermore, since Calcium is absorbed by the body at about four times the rate for Strontium, at equilibrium the Sr : Ca ratio in the bone will be approximately one quarter the Sr : Ca ratio in the total diet. The actual amount of radioactive Strontium-90 in the body will also depend on the ratio of radioactive Strontium to natural inactive Strontium in the diet ; for one given community this should not vary significantly, although it can vary widely between different races. When determining Strontium-90 activity the results are often expressed as the specific activity

of Sr90 relative to Calcium in terms of micromicrocuries Sr90 per gramme of Calcium. This unit is known as a Strontium unit (S.U.) from which it follows that $1 \text{ S.U.} = 10^{-12}$ curies Sr90 per gramme Ca. A curie is the unit used for measuring the rate of disintegration of a radioactive isotope. An activity of one curie means that 3.7×10^{10} atoms are breaking up every second. The weight of the element involved varies with its half-life and atomic weight and is one gramme in the case of Radium. These numbers are far too large to visualise and it is much simpler to remember that one micromicrocurie of any isotope represents 2.22 disintegrations every minute. In the case of Strontium-90 when equilibrium is reached one micromicrocurie represents an average of 2.22 atoms splitting up every minute to give the same number of Yttrium-90 atoms and 2.22 Beta particles; the daughter product also breaks down to Zr90 at this same rate to give a further 2.22 Beta particles. In all, therefore, 4.44 Beta particles per minute are released by one micromicrocurie of Strontium 90. The actual weight of Strontium-90 involved in an activity of one micromicrocurie is approximately 0.7×10^{-13} grammes. The present level of Sr90 fall-out contamination in milk is six micromicrocuries per pint. It follows from the above that there is only about one four-billionth of a gramme of radioactive Strontium present (of which approximately 13 atoms disintegrate per minute). This has to be separated chemically from 0.6 gramme of Calcium and from all interfering radioactive substances before a count of the Beta particles can be made and the Strontium-90 activity estimated. Generally four or more pints of milk have to be used to obtain a reasonably accurate count of the Strontium unless special elaborate and costly apparatus with a very low background can be used.

Milk.

When the monitoring of milk samples was commenced in the middle of September last, the activity of the insoluble oxalate fraction was found to be relatively high. Because of this and the importance of milk in the national diet and the large amounts consumed by children and babies a series of pint samples were tested. Some of these were then combined in groups of four for more detailed examination to ascertain the isotopes mainly responsible for the activity. Figure 1 gives the total Beta activity of the insoluble oxalate fraction of the milks examined, expressed as counts per minute per pint. The corresponding counts due to Strontium-90 are also shown. The actual number of disintegrations in the samples will be approximately 16 times greater than the count figures shown. This is due to the efficiency of the liquid counter which is influenced by geometry and by absorption in the solution and in the walls

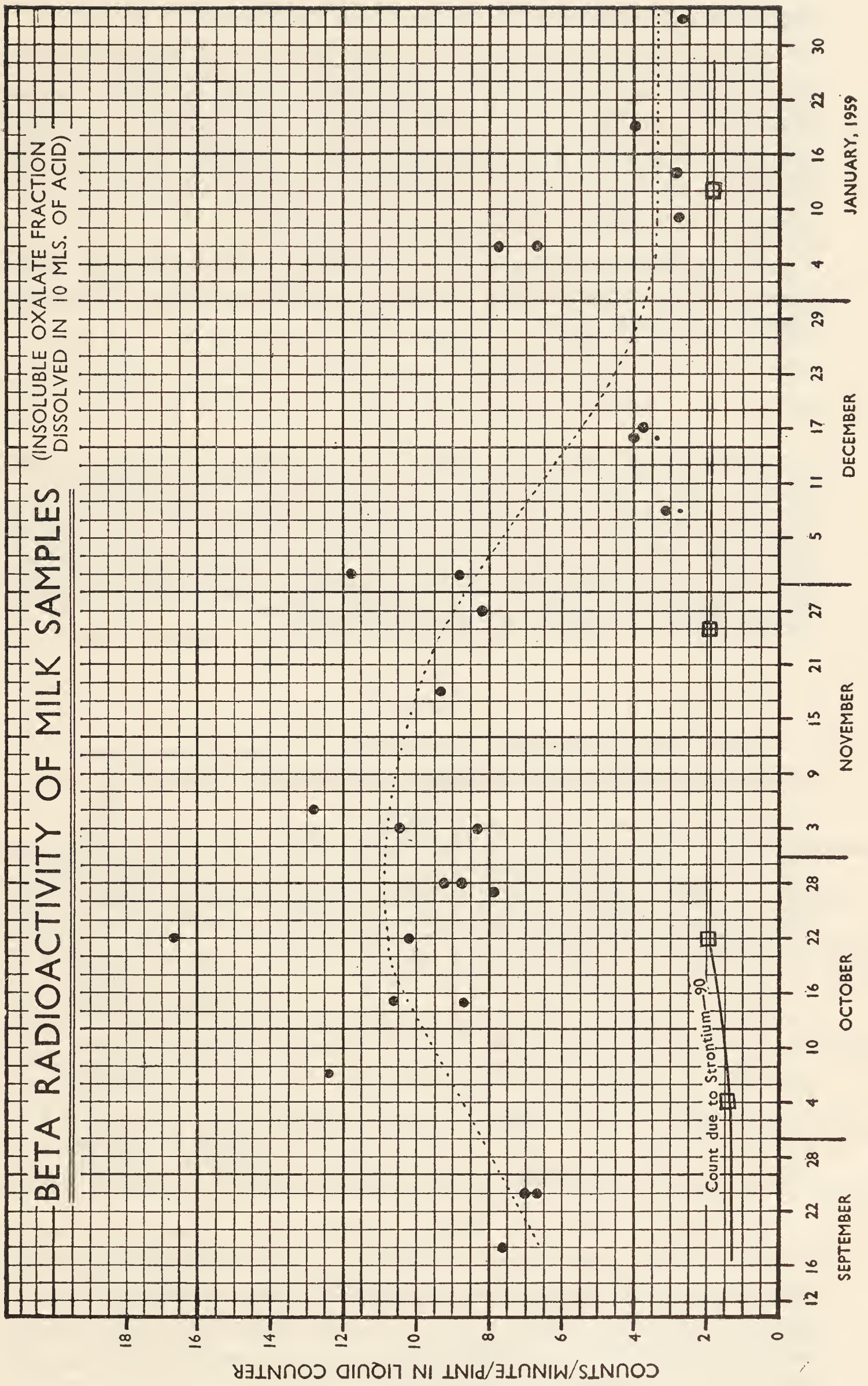
of the counter. It will be seen that the total Beta activity reached a maximum at the end of October and the beginning of November ; it then decreased to near the level for Strontium-90 in December. Detailed examination showed that most of the total activity was due to Strontium-89 which has a half-life of 51 days. Since a large number of nuclear weapons were tested at the end of October and beginning of November, it might be thought that the activity would not have started to decline until well into December or January ; particularly as it will be seen from table 37 that Strontium-89 reached a maximum in rainwater in November and was still high in December. This anomaly is due to the cows being taken indoors for the winter and living off hay and other foods not contaminated with Strontium-89. The three grouped milk samples, each consisting of four original samples, which were investigated further gave the following results :—

1.—Sampled 18th September to 15th October	... Sr90 8.7 uuc/gramme Calcium. ... Sr89 64.8 uuc/gramme Calcium.
2.—Sampled 22nd October to 28th October	... Sr90 11.8 uuc/gramme Calcium. ... Sr89 89.5 uuc/gramme Calcium.
3.—Sampled November 18th to December 1st	... Sr90 11.2 uuc/gramme Calcium. ... Sr89 87 uuc/gramme Calcium.

These two isotopes of Strontium accounted for practically all the activity of the insoluble oxalate fraction. Strontium-89 has a half-life of 51 days and its presence for short periods in food at the level found is not significant. The half-life of Strontium-90, however, is 28 years and as previously mentioned it follows Calcium into the bone structure. Present medical evidence suggests that the incidence of carcinogenic conditions of the bones is likely to increase if the level of Strontium-90 in the bone becomes greater than 100 uuc per gramme of Calcium. Due to the body's discrimination against Strontium in favour of Calcium, a general level in food of about 400 uuc per gramme of Calcium would have to be reached before the above level in bone would be exceeded. The present level in milk is about 1/40 of the limiting level in the diet as a whole. In this country milk is responsible for about half of the radioactive Strontium-90 in the average diet.

As a matter of interest it was found that the two samples of bone, from fell sheep, examined gave a total Beta activity expressed as Sr90, for the calcium oxalate fraction of 8.4 and 18.7 uuc/gramme Calcium respectively.

FIG. 1.



Vegetables and Canned Fish.

The vegetables tested gave total Beta counts, expressed as Sr90, for the insoluble oxalate fractions as follows :—Dried peas 42, rice 54, potatoes 28, cabbage 97 and lettuce 226 uuc/per gramme of Calcium. The last two samples were examined in more detail and the actual Sr90 contents were found to be 7.5 and 10.0 Strontium units respectively, the rest of the activity being mainly due to Sr89.

Four samples of canned fish from the Pacific Ocean area were tested but no activity beyond that due to the natural radioactive potassium isotope K40 was found.

Water.

Deposition by rain is the method by which the major portion of bomb fall-out activity is removed from the atmosphere. Hence sampling of rain should provide an effective means of monitoring for fall-out. An 18 inch square funnel has, therefore, been set up to enable sufficient rainwater to be collected for routine counting at the end of each month. The results so far obtained are shown in Table 37.

Table 37.

*Beta Activity of Rainwater collected in an 18 inch square funnel.
Results expressed as Counts per minute as measured in a liquid Geiger-Muller counter.*

Month.	Rainfall Inches.	Volume Water Collected. Litres	Total Beta Activity.	Caesium Fraction.	Cerium Fraction.	Strontium Fraction.		
						Strontium —90.	Strontium —89.	Remainder
October ...	4.80	22.9	1024	121	551	26 (4.85 u.u.c. per litre)	230 (71 u.u.c. per litre)	96
November ...	2.14	11.4	1330	46	840	10.5 (3.3 u.u.c. per litre)	271 (160 u.u.c. per litre)	203
December ...	3.36	17.9	2007	38	1218	10.7 (2.15 u.u.c. per litre)	155 (58 u.u.c. per litre)	585

The large volume of water collected each month has to be concentrated to a small volume for counting. After determining the total count the solution was divided by chemical means into three different groups of isotopes. The total counts of the Caesium and Cerium groups were measured and the two Strontium isotopes were separated from the third group and determined separately.

Over the three months the Strontium-90 has averaged 3.3 uuc/litre and the Strontium-89 96 uuc/litre. The concentration of Strontium-90 in this rainwater was, therefore, about 1/6th of the maximum limit at present recommended for drinking water :—*viz.* 20 uuc/litre. Most of the Strontium in rainwater is removed by filtration through the ground or absorbed on the solids which deposit in the reservoirs. To illustrate this point it may be mentioned that the five samples of upland surface mains water collected and tested during the same period as the rainwater samples showed only very small total Beta activity of the order of 2 counts/min/litre and two of these when examined more fully both gave 0.4 uuc/litre of Sr90 and 3.8 uuc/litre of Strontium-89. Two deep well waters examined gave counts not significantly different from the background count even when 8 litres were concentrated down to 10 mls.

Reverting to table 37 it will be noted that the count due to Strontium-90 in these samples is only a small and varying proportion of the total Beta count. This illustrates the point that a simple determination of the latter is not of much value in trying to assess the character of fall-out although it will indicate changes in magnitude and whether they should be regarded as potentially dangerous.

PART VI.—MISCELLANEOUS SAMPLES.

This section of the report includes those samples which, because of their nature or because of the circumstances under which they were obtained, could not be included in previous sections of the report. Four hundred and fourteen samples were examined under this heading and they were submitted as follows :—County Medical Officer of Health, 14 ; County Education Officer, 5 ; Chief Officer, County Fire Brigade, 4 ; County Police, Weights and Measures Department, 2 ; City of Lancaster, 57 ; County Borough of Preston, 92 ; County Borough of Southport, 28 ; Borough of Leigh, 64 ; Urban District of Walton-le-Dale, 14 ; Forestry Commission, 95 ; 39 samples were also examined for the information of the laboratory. The work carried out on some of the more interesting of these samples is discussed briefly in the following paragraphs.

Atmospheric Pollution.

During the year 1958, 137 deposits and rainwaters from soot gauges and 201 lead peroxide candles were analysed. These measurements were made on behalf of the County Borough of Preston, the County Borough of Southport, the City of Lancaster, the Borough of Leigh, the Urban District

of Walton-le-Dale and the North West Conservancy of the Forestry Commission. Altogether these six authorities have set up 13 standard deposit gauges and 18 sulphur candle instruments. A new measuring site at Preston and another at Walton-le-Dale came into operation during the year.

The standard soot deposit gauge consists of a large glass funnel of known area leading into a bottle large enough to hold a month's rainwater. The soot and water collected are brought into the laboratory at the end of each month for analysis, the minimum number of determinations carried out being those listed in table 38. The sulphur candles are porcelain cylinders of known area which are covered with a layer of lead peroxide prepared under standard conditions. This surface, on exposure at the site, reacts chemically with sulphur gases present in the surrounding atmosphere and when it is examined at the end of the month its sulphate content is proportional to the average concentration of corrosive sulphur gases in the air at that point for the whole of the month. This information is important as it is an indication of the effect of the polluted atmosphere on paintwork, metals, curtains, etc. It should be noted that, even if visible smoke and grit emission from chimneys are prohibited and smokeless zones become more common, sulphur gases will still be released into the atmosphere whenever coal or smokeless solid fuel is burned and it is these invisible gases which cause such damage to man, property and vegetation.

The results from the observations, as well as being of local interest, are also used as part of a nation-wide investigation by the Department of Scientific and Industrial Research to study any long term changes in atmospheric pollution and their possible effects on Public Health and other problems. The Forestry Commission's sites although in country areas can be affected appreciably by sulphur-dioxide produced many miles away and the survey has been undertaken to find out the effects of this gas on the growth of young trees.

To illustrate the nature and magnitude of the results obtained in this type of work the average monthly figures for the three sites in the Borough of Leigh are set out in tables 38 and 39. The Manchester Road and Firs Maternity Home sites are approximately one mile to the East and West of the central Town Hall site respectively. It will be noted that there is appreciably heavier pollution recorded by the Town Hall gauge, the soot and ash being approximately twice the corresponding figures for the other two gauges.

The results obtained for sulphur gases are very similar to those obtained during the previous two years but the soot gauge results are appreciably better in spite of the high rainfall. The figures for both insoluble and soluble solids are the lowest recorded from the Town Hall soot gauge over the last nine years.

Table 38.

*Soot Gauge Observations, 1958.
Monthly Averages in Tons per Square Mile.*

Site.	Borough of Leigh.			
	Manchester Road	Town Hall.	Firs Maternity Home.	
Rainfall in inches	3.42	3.47	3.52	
Carbonaceous matter and tar	2.40	5.35	3.31	
Ash	4.84	10.59	5.26	
	} 7.24*		} 15.94*	
Soluble deposit	5.44	6.71	6.03	
Total deposit	12.68	22.65	14.60	
pH	4.3	4.1	4.0	

* Insoluble Deposit.

Note.—Manchester Road gauge—measurements commenced in April.

Firs Maternity Home gauge—monthly results for January not available.

Table 39.

Estimation of Active Sulphur by Lead Peroxide Method, 1958.

Milligrammes of Sulphur Trioxide per 100 sq. cms. Batch "A" Lead Peroxide in Louvered Cover.

Site.	Borough of Leigh.		
	Manchester Road.	Town Hall.	Firs Maternity Home.
Daily Averages	1.97	2.35	1.95

Note.—Manchester Road instrument—measurements commenced in April.

Extraneous matter in Food and in Milk Bottles.

In addition to the samples of food submitted under the Food and Drugs Act which were found to contain insects or other extraneous matter the following samples were also examined as the result of complaints. Of the 11 samples mentioned below nine were submitted by the County Medical Officer of Health while the remaining two were submitted by an Autonomous Food and Drugs Authority.

Milk Bottle, Sample No. M.7611.

This pint milk bottle when received at the laboratory contained only traces of liquid milk but it also contained a film of light to dark brown solid material adhering to approximately one-third of the circumference of the interior bottom surface of the bottle. Upon examination this was found to consist of partially charred or caramelised milk solids probably due to the bottle having been allowed to stand on a stove.

Sievings from Skim Milk Powder, Sample No. M.7636.

This sample consisted of brown material in the form of small lumps and coarse powder sieved from the contents of a sack of skim milk powder. The material consisted of overheated particles of dried milk. Although the amount sieved off was only equivalent to 0.04 per cent. of the original dried milk it would be readily visible when the milk powder was reconstituted with water and would, as in this instance, give rise to complaints. Good quality skim milk powder should not contain visible particles of overheated milk.

Milk Bottle, Sample No. M.7637.

This sample consisted of a one-third pint milk bottle which was found to be slightly chipped on the top of the rim. The damage appeared to be of recent origin as a further small flake of glass came away from this area during the examination. A small thin flake of broken glass was submitted with the sample and this was alleged to have been found in the milk in the bottle. The density and refractive index of this fragment were found to be the same as those of the glass of the bottle and its shape was such that it could have been derived from the damaged rim of the bottle.

Cake, Sample No. M.7670.

This sample consisted of part of a small chocolate coated cake which had been found to contain what proved to be a piece of a dried leaf. The fragment did not appear to have any very characteristic diagnostic microscopical features and it was not possible to state the variety of plant from which it had originally been derived.

Milk Sample No. M.7706.

This sample was submitted in a one-third pint milk bottle which was nearly full when received. The bottle itself was not in any way chipped or broken and no fragments of broken glass were found in the milk. A small fragment of broken glass was submitted separately and it was stated that this had been sucked up through a drinking straw from this particular bottle of milk. The fragment would in fact pass through a drinking straw and its density was within the range of that of milk bottle glass but, in view of the fact that the bottle itself was not damaged, it was not possible to indicate the precise origin of the fragment.

Part Slice of Bread, Sample No. M.7735.

This sample was submitted by an Autonomous Food and Drugs Authority. It consisted of approximately two-thirds of a slice from a small loaf. No foreign matter was found in the sample itself but a small object submitted separately was stated to have originally been in the same loaf. This was identified microscopically as a pellet of mouse excreta to the surface of which baked dough was found to be firmly adhering. This sample was the subject of legal proceedings but the case was dismissed by the Magistrates as there was found to be some doubt as to the origin of the bread.

Canned Tuna, Sample No. M.7804.

This sample was found to contain six crystals, weighing in all 49 milligrammes. The crystals proved to be of Struvite (Magnesium Ammonium Phosphate) and they are occasionally formed from the natural juices in some varieties of canned fish. The crystals are not harmful.

Part Bottle of Sterilised Milk, Sample No. 7805.

This sample was submitted on complaint that it had a very bitter taste. Chemically the milk was found to be unadulterated. There was no evidence of the presence of any preservative, mineral salt or bitter alkaloidal substance. The sample, however, had a high acidity and it did not pass the turbidity test prescribed for sterilised milk. Certain bacteria cause a very bitter, quinine-like taste to develop in milk and the opinion was expressed that the taint in this particular case was probably bacterial in origin due to the faulty sterilisation of the milk.

Milk Sample, No. M.7884.

This sample consisted of a full one-third pint bottle of milk. The rim and the inside of the neck of the bottle bore a minute trace of turquoise coloured material which gave reactions for iron and copper and was

probably water colour pigment or distemper. No evidence of the presence of this material in the milk itself could be found. The milk appeared to be normal in composition, toxic metals being absent and the amounts of copper and iron present being within the range found in genuine milk.

Soft Drink Bottle, Sample No. M.9722.

This empty soft drink bottle was submitted because, after the contents of the bottle had been consumed, it was noted that it also contained five small reddish-brown objects each about 4 millimetres long. These were found upon examination to consist of two pupae and three empty pupae cases of small fruit flies (*Drosophilidae*). These flies breed on fruit, pickles, chutney, fruit pulp and in vinegar vats, etc. They also breed in milk bottles and other food receptacles containing traces of milk, etc.

Foreign Matter found in Bottle of Pasteurised Milk, Sample No. M.7958.

This sample consisted of a pad of soft white to grey material measuring approximately $1\frac{1}{2}$ inches by $\frac{1}{2}$ inch, stated to have been present in a pint bottle of pasteurised milk. Macroscopically it had the appearance of a damp piece of paper or cotton wool but on microscopical examination it was found to consist of a thickly felted mass of fungus hyphae and spores. It had probably been formed as the result of fungus growth on milk residues previously left in the bottle.

PHARMACY AND POISONS ACT, 1933.

Phenol Disinfectant, Sample No. M.7705.

This sample was purchased by an Inspector, appointed by the Lancashire County Council under Section 25 of the Pharmacy and Poisons Act, 1933, from a retailer whose name was not entered in the list of persons who are entitled to sell poisons included in Part II of the Poisons List. Upon Analysis the sample was found to contain 11.8 per cent. by weight of phenol and its homologues (tar acids). Substances containing phenols in any less amount than 60 per cent. by weight are included in Part II of the Third Schedule of the Poisons List Order and can, therefore, only be sold by authorised sellers of poisons or by persons whose names are entered on the Local Authority's list. The definition of phenols for the purposes of the Pharmacy and Poisons Act does not include all the substances known chemically as phenols but only those in the homologous series of which the first member is phenol and which vary in composition

from member to member by one atom of carbon and two atoms of hydrogen. Thus, phenol, cresols and xylenols are phenols for the purposes of this Act but B-naphthol and chlorinated phenols are excluded from the definition. Legal proceedings were instituted against the vendors of this sample and at the hearing of the summons the firm pleaded guilty and was fined £4 4s. and £7 7s. costs (£11 11s. in all).

Kettle Descaler, Sample No. M.7857.

This commodity was manufactured in the County area and it was submitted by the Chief Inspector of Weights and Measures in order to ascertain whether it was a poison within the meaning of the Pharmacy and Poisons Act. Upon analysis it was found to consist of an aqueous solution of phosphoric acid, containing 85.5 per cent. by weight of phosphoric acid (H_3PO_4). Phosphoric acid is not a substance included in either Part I or Part II of the Third Schedule of the Poisons List Order, 1958, as amended, and its sale, therefore, does not come within the provisions and restrictions of the Pharmacy and Poisons Act.

Compound Fertiliser, Sample No. M.7669.

This sample was submitted by the water Engineer of an Autonomous Authority to ascertain whether any deleterious substances were present which would militate against its use on land forming part of the gathering ground for a water supply. The material was an ordinary compound fertiliser and its impurities included approximately 135 parts per million of water soluble arsenic and approximately 2260 parts per million of water soluble fluorine. It was indicated that if the volume of water resulted in a dilution of 1400 times in relation to the arsenic content or 4500 times in relation to the fluorine content, the amounts of arsenic and fluorine finally present would become insignificant.

Beef Sausages, Sample No. M.7771.

This sample was submitted by the Chief Public Health Inspector of an Autonomous Food and Drugs Authority following a request for advice from the Supplies Officer of a hospital. The sausages had not been purchased but had been made in the kitchen of the hospital. When received at the laboratory, the sample was very moist and the sausage meat was discoloured greyish-green immediately below the casings. The free ammonia content of the sausage skins was 0.24 milligramme per gramme, that of the meat adjacent to the skins was 0.13 milligramme per gramme, while that of the meat in the centre of the sausages was only 0.06 milligramme per gramme. The acid value of the fat in the sausages was 9.6. The greyish-green discolouration of the sausages was typical

of that caused by bacterial spoilage of moist meat out of direct contact with air (inside the sausage skins) and was probably originally due to the skins having remained in water too long and to the meat being too moist and being allowed to warm up during sausage making.

Other samples which may be mentioned briefly included :—a home brewed ginger wine which was found to be free from significant amounts of toxic metals and which contained 1·9 per cent. by volume of alcohol. Two samples of sterilised milk were submitted by the Chief Public Health Inspector of a County District following a complaint of taint. A sample of potatoes was found to be free from chlorinated hydrocarbons and toxic metals. Three other samples of Potatoes submitted by the Medical Officer of Health of an Autonomous Food and Drugs Authority specifically for determination of Arsenic were found to be free from this element. An insulating slab was submitted by an Autonomous Authority on complaint that it had an objectionable odour. This slab consisted of foamed material and the cavities in the slab were found to contain sulphuretted hydrogen gas in an amount approximately equivalent by volume to one quarter of the total volume of the slab. The odour of sulphuretted hydrogen was only apparent when the smooth surface of the slab was damaged and the cellular cavities exposed. Two samples of mud were submitted by an Autonomous Authority in order to ascertain whether they were of similar origin and whether they showed evidence of contamination by sewage. Four samples of anti-freeze mixture for use in the cooling systems of motor vehicles were examined for the Chief Fire Officer in order to ascertain whether they complied with the contract specification. A sample of washing powder also supplied under specification was examined for the Chief Education Officer and four samples of domestic bleach were examined for the same officer to ascertain their available chlorine contents and which was the best value for money.

